STUDY OF AIRPOWER

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HEARINGS

BEFORE THE

SUBCOMMITTEE ON THE AIR FORCE

OF THE

COMMITTEE ON ARMED SERVICES

UNITED STATES SENATE

EIGHTY-FOURTH CONGRESS

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AIRPOWER

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STUDY OF AIRPOWER

MONDAY, APRIL 30, 1956

UNITED STATES SENATE,
SUBCOMMITTEE ON THE AIR FORCE
OF THE COMMITTEE ON ARMED SERVICES,
Washington, D. C.

The subcommittee (consisting of Senators Symington, Jackson, Ervin, Saltonstall, and Duff) met, pursuant to call, at 2:45 p. m., in the Old Supreme Court Chamber, United States Capitol, Senator Stuart Symington (chairman of the subcommittee) presiding.

Present: Senators Symington, Jackson, Ervin, Saltonstall, and Duff.

Also present: Fowler Hamilton, general counsel; Ramsay D. Potts, Jr., associate general counsel; Fred B. Rhodes, legal consultant to Senator Saltonstall; Edward C. Welsh, assistant to Senator Symington; and Wallace L. Engle and Ronald Friedenberg, staff members.

Mansfield Sprague, General Counsel, Department of Defense; Brig. Gen. Thomas C. Musgrave, Jr., USAF; Capt. S. S. Searcy, assistant director, progress analysis group, United States Navy; Col. C. E. Scott and Col. J. F. Kirkendall, aides to General Partridge; and S. Sgt. Michael A. Piranio.

Senator SYMINGTON. We will call this executive session to order.

General, will you rise to be sworn? Have you anybody else here who will testify in addition to yourself?

General PARTRIDGE. Colonel Kirkendall might provide certain information.

Senator SYMINGTON. Will you have him come up here, please?

Gentlemen, would you raise your right hands.

Do you solemnly swear that the testimony that you are about to give before this subcommittee of the Committee on Armed Services of the Senate of the United States will be the truth, the whole truth, and nothing but the truth, so help you God?

General PARTRIDGE. I do.

Colonel KIRKENDALL. I do.

Senator SYMINGTON. Will you be seated. General Partridge, we will see you in open session. At that time I would like to make some details of your great career part of the record.

At this point I state only that General Partridge is the commanding general of the Air Defense Command and also of Continental Air Defense; is that correct?

General PARTRIDGE. Yes, sir; correct.

Senator SYMINGTON. General, have you a prepared statement, or would you like to handle this, as a briefing?

General PARTRIDGE. As a briefing, if I may. I have a prepared briefing which I will follow in general; and in addition, will introduce supplementary remarks. And for that reason, I believe if the reporter would take verbatim what I say——

Senator SYMINGTON. You haven't any extra copies, have you, so that the committee could follow you visually as well as orally?

General PARTRIDGE. We have them, but they are not here.

Senator SYMINGTON. That is all right.

General PARTRIDGE. I will provide copies, and copies of the charts which I will use, which are available.

Senator SYMINGTON. Senator Saltonstall, have you any comment at this time?

Senator SALTONSTALL. No, Mr. Chairman.

Senator SYMINGTON. Senator Jackson?

Senator JACKSON. No.

Senator SYMINGTON. Senator Duff?

Senator DUFF. No, thank you.

Senator SYMINGTON. Mr. Counsel?

Mr. HAMILTON. We have organized this, as it is apparent to the committee, in terms of a briefing by General Partridge, having in mind that would be the most effective way of getting the available information with respect to the Air Defense Command.

Senator SYMINGTON. At this point, we note that an additional observer is present. We have, at the request of the Assistant Counsel of the Department of Defense, a naval representative here.

The committee said they would be glad to have a naval observer. Captain Searcy, we welcome you to our group; and if at any time there is any information you would like to have, please discuss it with our counsel, Mr. Hamilton, and/or with any members of the committee, in accordance with the rules of the committee and we will be very glad to see you get it.

The purpose of these hearings is to obtain and send out as many facts to the people as possible—all facts which will not help the possible enemy.

Captain SEARCY. Thank you, sir.

Senator SYMINGTON. General Partridge, will you proceed?

TESTIMONY OF GEN. EARLE E. PARTRIDGE, COMMANDER IN CHIEF, AIR DEFENSE COMMAND AND CONTINENTAL AIR DEFENSE COMMAND, UNITED STATES AIR FORCE

General PARTRIDGE. Yes, sir.

Mr. Chairman and members of the subcommittee, you have listened to General LeMay describe the offensive capability of the United States Air Force, and in the process he dealt with the Soviet long-range air force.

I believe you will agree that we have now arrived at the time in history when, if unopposed, it is possible for one nation's air force to destroy another nation, both militarily and economically.

I should like to describe for you today the air-defense system which we are setting up in the United States to counteract this Soviet threat.

BACKGROUND

I should like to describe to you first the background of the Continental Air Defense Command; second, present the threat against which we must be prepared to operate; third, outline for you the organization of the Continental Air Defense Command, and tell you of the resources with which we work; and lastly, I should like to touch on some of the factors which must be considered as limiting our effectiveness.

First of all, what is the background of the Air Defense Command and the Continental Air Defense Command?

Mr. HAMILTON. Pardon me, General. I wonder if I am violating the rule, but are you using those terms interchangeably?

General PARTRIDGE. No; but I will describe them in a moment. Specifically, the Air Defense Command is the Air Force component of the Continental Air Defense Command. In the reorganization of the Air Force which followed World War II, the then Army Air Forces set up three major commands. One of these was the Strategic Air Command; the second was the Tactical Air Command, and the third was the Air Defense Command, the same three organizations which we have today.

Senator SALTONSTALL. Who set that up, excuse me, General?

General PARTRIDGE. The Army set it up in the Army Air Forces in March 1946.

Senator SALTONSTALL. Thank you.

General PARTRIDGE. Unfortunately, for some years thereafter there was little emphasis on the requirement to build up the Air Defense Command.

Senator SYMINGTON. May I interject, for the record, what you really meant was that the War Department set it up in March of 1946.

General PARTRIDGE. I stand corrected. The War Department, the Army, set up in the Army Air Forces these three combat commands: Strategic, Tactical, and Air Defense.

The Soviets were just starting their long-range air force, using copies of our B–29, and they did not have atomic weapons. I am speaking now of the period from 1946 to the next year or two. The Air Force was separated in 1947.

As a matter of fact, the Air Defense Command received little attention until 1949 when it became apparent to the people who were working on plans that the Soviets were in fact building a very good strategic air force with TU–4, B–29 type aircraft.

Of course, the explosion of an atomic device in the fall of 1949 accelerated this requirement to get ahead with our air-defense operations here in this country.

In 1950, at the start of the Korean operation, we initiated a program with the necessary priorities and resources to expedite to the maximum the placing of the Air Defense Command on a 24-hour-a-day operational basis.

In this effort to get going in the Air Defense Command, we made a major step in January of 1951 when we separated the Air Defense Command from the Continental Air Command, of which it had previously been a part. The Continental Air Command is the geographical command which extends all over the United States, and which

handled at that time not only air defense but Reserve, National Guard, local contacts, and so on.

At this time we separated the Air Defense Command, in 1951, and gave it the sole mission of defending the United States.

Following that separation, immediately following, the Army set up the Army Antiaircraft Command, with its headquarters at Colorado Springs alongside the Air Defense Command, and in the years from 1951 until 1954, we had a coordinated air-defense effort, coordinated between the Army and the Air Force, with General Chidlaw as the head.

It became apparent during these 3 years that it was necessary to have a single head over the continental air-defense system. For that reason, the Continental Air Defense Command, as such, was set up. This is an organization which I will describe to you in a moment, but in essence it is a joint command responsible to the Joint Chiefs of Staff. I have a chart on it which I will show you directly.

From this brief background, then, let us turn to the threat against which our Air Defense Command, Continental Air Defense Command, too, if we like, must be prepared to operate.

In these discussions I will use national estimates.

Mr. Hamilton. Of the enemy's position?

General Partridge. Of the enemy's position, yes. In these discussions of the threat against which we must be prepared to operate, I am relying strictly on national estimates.

Senator Symington. Senator Saltonstall, and other members of the committee, it has been difficult for me, and I am sure it has been for you and Senators Jackson and Ervin, to be with General Partridge; and therefore I would ask permission, inasmuch as the counsel has spent considerable time with General Partridge, that he interject at any time for clarification purposes, for the benefit of the rest of the members of the committee.

Mr. Hamilton. Is that satisfactory?

Senator Duff. Yes, sir.

Mr. Hamilton. Just to clear up terms.

Senator Symington. Would you do that?

NATIONAL INTELLIGENCE ESTIMATES

Senator Saltonstall. Mr. Chairman, I wish you would clear up that term of "national" now. I think I know what it means.

Mr. Hamilton. National estimates.

Senator Saltonstall. That is the first time I have heard it used that way.

Senator Jackson. That is combined intelligence information of CIA.

Mr. Hamilton. Am I right, General, in thinking that is a general estimate to which all of the intelligence agencies agree, even though their individual appraisal may differ somewhat from it?

General Partridge. Yes. There is provided for my use what is called a national intelligence estimate. It comes out periodically, introducing new intelligence data that may have been acquired over the past, say, year, and——

Senator Saltonstall. That is the data that are presented to the National Security Council?

General PARTRIDGE. Yes; and used by the Army, Navy, Air Force, Marine Corps, and anybody else who has the need to know.

Mr. chairman, it might be helpful if the committee would interrupt for questions. This is a very complicated subject, and I am dealing quickly——

Senator SYMINGTON. If we do that, I am afraid we will stay too long, and Senator Saltonstall has an engagement at 5 o'clock.

We expect to see more of you. We can read the record; and I would suggest, if you have copies of what you are reading now, you take steps to see that each Senator gets one in his office at your earliest convenience, so he can read that prior to the record coming out.

But in order to proceed as quickly as possible, I would prefer at this time to follow our regular rules.

General PARTRIDGE. Very well.

GROWING STRENGTH OF SOVIET BOMBER FORCE

These estimates, these national intelligence estimates, state that in 1956, this year, the Russians have sufficient bombers to launch an initial attack against the United States employing hundreds of bombers. [Deletion by Department of Defense censor.]

We estimate that a large percentage of these bombers [deletion by Department of Defense censor], if unopposed, would be able to get to the target area; in other words, penetrate our defenses.

By 1959, this Russian bomber force will be large enough to launch against us a stronger attack [deletion by Department of Defense censor]; and we estimate that in that year, 1959, even more [deletion by Department of Defense censor] might actually arrive within our defenses.

[Deletion by Department of Defense censor.]

Mr. HAMILTON. Pardon me, General, when you say "within," do you mean they get through our defenses, or just engage our defenses?

General PARTRIDGE. Yes; engage our defenses; they would come to the perimeter, in any event.

Mr. HAMILTON. Come to the point of contact?

General PARTRIDGE. Yes.

Mr. HAMILTON. But you don't mean that many will get through?

General PARTRIDGE. No. You will note I said "if unopposed."

Mr. HAMILTON. I see.

General PARTRIDGE. [Deletion by Department of Defense censor.] In other words, they would not be required to abort the mission because of mechanical failure, bombsight failure, and so on, lost in the weather, or for any other reason. Is that clear?

Mr. HAMILTON. Yes.

General PARTRIDGE. Let me show you pictures of four aircraft which presently comprise the bomber force of the U. S. S. R.

SOVIET BOMBERS

The first of these, and the one in largest numbers at present, is the Bull. This is a copy of our B–29, and commonly called the TU–4. They previously had a very large force of this type, probably in excess of a thousand [deletion by Department of Defense censor], but

they are gradually reducing it by replacing these aircraft with Badgers, which I will show you in a moment.

They still have, however [deletion by Department of Defense censor] a large force of Bull aircraft in the present inventory.

The Russians brought out three new jet bombers, which have been added to the Bull inventory and give them the capability which I mentioned above, of launching substantial numbers [deletion by Department of Defense censor] of bombers against the United States.

The first of these to come out was this aircraft shown here, the Badger. It is a strictly modern, two-engine jet high-altitude bomber. It is comparable to our B–57. [Deletion by Department of Defense censor.]

Mr. HAMILTON. You mean B–57, or——

General PARTRIDGE. B–47. Thank you very much.

At the present time they have [deletion by Department of Defense censor] these in operational units.

They also brought out and are producing in large numbers a heavy bomber capacity to our B–52. This is the Bison. [Deletion by Department of Defense censor.]

I should like to invite your attention to the 4 large intake ducts which indicate that they have 4 very powerful jet engines.

In other words, in the Bison they are doing with 4 engines what we are doing with 8 in the B–52.

The other aircraft, for which we have no counterpart, is the BEAR. This is a turboprop bomber of extremely long range. The Soviets now have [deletion by Department of Defense censor] these in operational units; and the reason that it is built is to get not only the high altitude and the high speed, but to get the extreme range which the Soviets feel they need for a 2-way attack on this country, unrefueled.

[Deletion by Department of Defense censor.]

All of these figures are computed on a 10,000-pound bombload. I might say that most excellent charts in the national intelligence estimates demonstrate a wide variety of ways in which the Soviets might use these weapons, particularly their range, to attack the United States.

The charts in the back of the national estimates are so good that I have not provided any charts for the committee.

In evaluating the Soviet threat, we feel [deletion by Department of Defense censor] that the Soviets, if they attack at all, would launch a very large-scale air attack against this country, and that they will do their best to achieve surprise.

SOVIET SUBMARINE THREAT

In talking to the counsel this morning, he mentioned the matter of attack by missiles or aircraft launched from submarine bases. [Deletion by Department of Defense censor.]

I might point out that it would be very difficult for the Soviets to put large numbers of submarines along our coasts undetected; and since they will be working for surprise, we rather think they will make their initial attack based on use of aircraft such as I have shown you on the screen.

A Soviet submarine attack would, however, pose a great threat to us after the initial attack, because some 30 percent of the profitable targets in the United States lie within 150 miles of the shores.

PROBABLE SOVIET TARGETS

Now, let's turn to the problem of what objectives this Soviet bomber force would probably attack.

We believe the first targets to be attacked would be those locations from which we might mount our retaliatory strikes or from which we would get our atomic capability; in other words, Strategic Air Command bases, and the Atomic Energy Commission installations. They are shown on the chart, and I ask you to look at it only because it shows the wide distribution throughout the United States. (Deletion by Department of Defense censor.)

In addition to this target system, we believe this one would be attacked, there are in the United States about 170 standard metropolitan areas.

Now, you probably ask what a standard metropolitan area is. It is a key facility or a locality with a population of 50,000 people or over.

There are some 230 cities in the United States that have 50,000 people or more. Some of these combine to make a single target suitable for attack by one large weapon. For instance, Minneapolis-St. Paul would be atacked by one weapon.

The three zones you see divided by the heavy black lines happen to be the three areas which separate my command into an eastern, a central, and a western defensive force.

Mr. HAMILTON. General, when you say "would be," they could be attacked, or you believe they would send only one aircraft with one weapon?

General PARTRIDGE. Only one weapon would need to be delivered effectively to any one target.

(Deletion by Department of Defense censor.)

You may think that 170 targets is a very small number, but let's look at the concentration of resources in those target areas.

If we assume that the Russians could push home an attack of only—that would put just 50 bombs on the target, and that the bombs were placed properly, and were of the proper size, we would destroy or at least bring under fire about 40 percent of the population, 50 percent of the key facilities, and 60 percent of the industry of the United States, total.

DISASTROUS ATTACK

If all 170 targets were successfully attacked, some 55–58 percent of the population and 75 percent of the industry would be brought under fire, with disastrous results.

I am sure you all agree that such an attack (deletion by Department of Defense censor) in this country would be catastrophic.

The next question to discuss is: Do they have the weapons——

Senator JACKSON. May I ask one question, Mr. Chairman?

General PARTRIDGE. By all means.

Senator JACKSON. May I ask the question—what was the rule?

Senator SYMINGTON. I thought we would go through the briefing without asking questions, but I would like to follow the committee on it.

Senator Saltonstall, you have had far more experience than any of us have had on this. What do you think?

Senator SALTONSTALL. With that proviso, Mr. Chairman, I want to answer just as sincerely as I can. I think that we would get more as a whole if we let the general go through with his testimony and let counsel ask such questions as he feels necessary, because with the depth of mind of the members here we would never get anywhere.

Senator SYMINGTON. How about having a slight deviation from the established rule, which means when you, Senator Duff, or Senator Jackson have a question that you think is important enough you might slip it to the counsel, in the hopes—expectancy, I might say—that he would accede to your wishes.

Senator SALTONSTALL. That would be entirely satisfactory to me.

Senator JACKSON. I have already passed it to the counsel.

Senator DUFF. I will agree with whatever the majority want to do.

Mr. HAMILTON. I have been asked to ask, sir, if you have any figures that would indicate the comparable number of targets in the Soviet bloc area.

General PARTRIDGE. No, sir; I do not.

Mr. HAMILTON. We will get that from some other source.

Senator SYMINGTON. Will you proceed, General.

General PARTRIDGE. I think this chart very simply answers the question, "Do they have the weapons to attack these targets?" [Deletion by Department of Defense censor.]

On the left side, the index, which is not very clear to me, it shows a very large spot where they are using 10-megaton bombs, and the little spots indicate 100-kiloton bombs.

(Deletion by Department of Defense censor.)

They are producing various-size bombs in quantity.

The sizes they would use would, of course, be dictated by military requirements.

SOVIETS HAVE CAPABILITY

I believe we must assume, then, from the data which I have given you and which General LeMay and others have given you that the Soviets have the capability for air attack on the United States using large numbers of modern bombers, and that they have sufficient numbers of weapons to destroy the key targets in this country unless those targets are well defended.

ORGANIZATION OF CONTINENTAL AIR DEFENSE COMMAND

Using the statement of the threat as a background, let us now turn to the organization of the Continental Air Defense Command. This, you will recall, is the command set up under the Joint Chiefs of Staff in September of 1954.

I occupy the block marked "CONAD"; also the block marked "ADC." In other words, I wear two hats. I am the commander of the Continental Air Defense Command, a joint, the only joint command; and the Air Force component of that command.

As Air Force component commander, I report to the Chief of Staff on Air Force matters. Similarly, Admiral Goodwin, who is the com-

mander for naval forces, CONAD, reports to the Chief of Naval Operations on all matters pertaining to administrative, administration, logistics, and so on, and for command purposes.

Similarly, on the other side, Lt. Gen. Stanley Mickelson commands the Army Antiaircraft Command, and reports to the Chief of Staff of the Army.

As CinCCONAD, Commander in Chief, CONAD, I report through the United States Air Force to the Joint Chiefs of Staff.

Our command is a little bit different than you find in overseas theaters. It is not a unified command. I do not operate through the component commanders. I have direct operational control of the forces placed at my disposal. I operate individual fighters and give directions to the antiaircraft artillery and the antiaircraft weapons, through a joint organization which you see marked there "Joint Air Defense Force," Joint Air Defense Division and the lower echelons.

I am not responsible for any air defenses outside of the United States. In other words, I am not responsible for the air defenses of Europe or the Far East.

We do put units together to send overseas. We provide tactical doctrine; we have requirements for weapons such as fighters. They use the same system, basically, that I do. But I have no responsibility for air defenses outside of the continental United States and the adjacent waters.

BASIC AIR DEFENSE FUNCTIONS

Now, how do we operate? I think it is essential that you keep in mind the four very simple basic functions that are carried out in air defense, here reduced to their very simplest forms.

The four basic actions are: Detection, identification, interception, and destruction.

By detection, we try to find out who is flying over or coming into our airspace.

Second, we have to identify these incomers or these unknowns.

If we can't do that, we have to intercept them; we have to go up and take a look at them.

And, in the process, we must be prepared to either destroy this aircraft that is flying, or turn it over to the ground weapons, as you see depicted on this chart.

If you will keep these four basic actions in mind, I believe it will make it relatively simple for you to fit the pieces into the overall system.

DETECTION AND IDENTIFICATION

To carry out the detection work that must be done within the air defense system, we rely principally upon radar. This chart shows the present radar coverage, not only in the United States but in other parts of North America and in Iceland.

This is the coverage which you might reasonably expect to get against an aircraft flying at 40,000 feet.

As you can see, it covers practically all of the United States. It extends across the southern border of Canada, a line called the Pinetree line, and in the Northeast Air Command.

Then there are defenses in Alaska, around Thule on the northwest corner of Greenland, as well as in Iceland.

Information from this widespread——

Mr. HAMILTON. General, when you say "defenses," do you mean radar and defenses?

General PARTRIDGE. There is a fighter squadron in Iceland, too, but it is outside my area. Perhaps I should make clear here that my responsibility covers, I shall say it again to make sure we all get it, my responsibility covers at the present time only those defenses in and around the United States, immediately adjacent to the United States.

Canada runs its own air defense; Northeast Air Command runs its own air defense; Alaska does; and so on.

Information from this radar system comes very quickly to my headquarters in Colorado Springs.

We have instant communications, telephone communications and teletype as well, with other commands.

I just pick up my phone at Colorado Springs and I have Alaska or wherever I want.

In the United States proper we do not even try to keep track of all the aircraft that fly. We have a system known as ADIZS, air defense identification zones.

You will note that the one on the east, marked out by that red area, surrounds what is essentially the northeast heartland of the United States.

Perhaps you will remember the concentration of targets in this area. There is one around the Atomic Energy installations at Albuquerque and another one on the west coast.

Furthermore, we have by arrangement with Canada an air defense identification zone extending across the red lines seen there, and we have a very thin line, a very tenuous one, along the Mexican border.

In the United States there are about 30,000 aircraft flights a day, and there are about 600 flights come in from overseas today.

It would be quite impossible for us with the amount of equipment presently available or any amount that we expect to get to keep track of all these, so we try to identify and make sure we keep track of those whose tracks appear significant and which seem to be headed into sensitive areas.

This is done principally by coordination with the Civil Aeronautics Authority. We would not be able to carry on our business if we did not have the complete assistance and cooperation of the CAA.

You may wonder how many aircraft we have flying around the country that do not get properly identified.

In a normal day, and I get a report on this at my headquarters every morning, we have about 30, 35, something of that order of aircraft, detected in the United States in our radar coverage and not properly identified.

We work against these with our fighters, scramble fighters to go up and look at them, send them off to look at them. [Deletion by Department of Defense censor.]

The radar coverage which I showed you in an earlier chart is being improved and increased, and I would now like to show you what we expect to have by 1961.

We will have all over the United States and southern Canada in the area shown by red complete radar coverage.

It will be good at high and intermediate altitudes and it will be acceptably efficient even at low altitude.

In this area, the area shown in red covering the United States and southern Canada, we should be able to carry out combat operations.

In other words, we should be able to send off fighters and missiles and actually intercept and destroy aircraft.

(Deletion by Department of Defense censor.)

Across the central part of Canada you see a dotted line which represents the position of the mid-Canada line presently being constructed by the Canadian Government.

Still further to the north and about 1,200 miles from our Canadian border is the distant early warning line which has been described so thoroughly in recent press releases.

Still further to the west you see the defense filled out in Alaska and extending along the Aleutian chain to meet a series of stations to be provided by the Navy in the Pacific, and I will describe to you that line in a little more detail in a moment, show you what makes it up.

[Deletion by Department of Defense censor.]

On the east you see that the coverage of the radar has been extended further. [Deletion by Department of Defense censor.]

There is also a flank to be provided by the Navy [deletion by Department of Defense censor].

The Navy will put in additional resources in the form of airborne early warning aircraft and picket ships [deletion by Department of Defense censor] so that we should have a reasonably good screen through that area.

I will show you some pictures of the airborne early warning aircraft and picket ships in just a moment.

Now this system as a whole and as you see it here, as you saw it on previous charts, is generally referred to as the ground environment. It should be apparent to you from looking at it [deletion by Department of Defense censor], that it is going to be a pretty complicated and a pretty expensive installation before it is finished.

[Deletion by Department of Defense censor.]

Mr. HAMILTON. When will the program you have outlined be finished, approximately?

General PARTRIDGE. Not completely, for a matter of years.

It is obvious to me working at the business, and perhaps it is to you as well just seeing it for the first time, that we have to tie this whole system together operationally by some manner or means.

There are plans underway at the present time to centralize at Colorado Springs at my headquarters the operational control of all of this system except the part marked in blue, which will remain the function of the adjacent naval commands.

In working on the system even under the present arrangements, I have to work with a large number of commands and I would like to show you what they are.

The green part marks the continental United States, the blue adjacent on the east coast and the west coast might well represent our extensions of the radar coverage and I will show you how that is done in just a moment.

I have to work with Admiral Wright in the Atlantic, Admiral Stump in the Pacific. We have very close tie-ins even now with the Alaskan Command under General Atkinson with Air Vice Marshal Wray who runs the Canadian Air Defense Command and with General Barcus, of the Northeast Command.

Mr. HAMILTON. What is the greatest height attributed to any of the Russian planes at the present time; their bombers?

General PARTRIDGE. Their bombers?

Mr. HAMILTON. Perfected bombers.

ALTITUDE DEFICIENCY OF UNITED STATES FIGHTERS

General PARTRIDGE. There are various estimates, depending upon whether they resort to one-way missions or use aerial refueling. The altitude limitation of most of our present fighters is a defense deficiency against modern bombers. [Deletion by Department of Defense censor.]

Senator SYMINGTON. General, this is Senator Ervin.

General PARTRIDGE. How do you do, sir.

Mr. HAMILTON. I take it from what you have said that the height of our radar will go up?

RADAR IMPROVEMENT EXTENDED

General PARTRIDGE. Yes; it will. [Deletion by Department of Defense censor.] Improvements presently being installed will raise the coverage of our heavy radar [deletion by Department of Defense censor].

Mr. HAMILTON. Within?

General PARTRIDGE. Within the next 2 years.

I would like to show you now how we extend our radar coverage to the eastward and to the westward along the continental United States.

We cannot do this entirely by land-based stations because, as you know, radar is a line-of-sight proposition and you can only reach out as far with radar as you can go without running around the curvature of the earth.

There are three ways in which we can improve our coverage to seaward. We are using all of them, and I would like to show you some pictures to demonstrate how it is done.

First of all, we use picket ships provided by the Navy. This one happens to be a destroyer. It is a floating radar station equipped with excellent communications and stationed in the ocean where it can observe by radar the passing of any aircraft that fly through that area.

Newer ships are being provided. These are of the Liberty class, World War II, quite spacious, very well suited to the task.

(Deletion by Department of Defense censor.) These ships are able not only to carry out the detection but the identification phase and if necessary to control fighters to make an attack on any incomer.

Another means of extending our radar coverage to seaward is by the establishment of Texas towers in the shallow water offshore. Five of these are scheduled to be placed about 100 miles off the east coast opposite New England and New York. The idea for this structure came from the marine oil-drilling platforms that we find in the gulf opposite the coast of Texas, hence the name Texas tower.

Actually in their configuration they have gone a long way from the oil-drilling rig. The three domes that you see are quite typical of radar stations. The one on top houses the heavy radar; the two on the side provide coverage for the height finder and there are cranes for

raising supplies and so on, a platform for landing a helicopter, communications equipment which you can see in the form of a dish on the far left of the picture.

There are several of those along the side headed toward shore and there are crew quarters and working space in the area between the decks.

It is about 80 feet from the deck down to the water. You can see what a large structure it really is.

One other means we use for extending our early warning is the airborne early warning and control aircraft. This is a Lockheed Constellation. It has a very large radar compartment about 16 feet in diameter, housing a rotating radar.

On the top there is a dome which you can barely see against the cloud background. It houses a height-finder radar. These aircraft do the same thing the picket ships do. They take up a station at sea, orbit, fly around in a circle out there, and the radar underneath the aircraft detects other aircraft flying in the vicinity.

It has plotting boards, communications equipment, controllers, the ability to do in the air the same things that can be done by the land-based or the sea-based radar stations.

Mr. HAMILTON. Do we have those out there now circling 24 hours a day, General?

General PARTRIDGE. Yes. [Deletion by Department of Defense censor.]

Mr. HAMILTON. How far out do they go?

General PARTRIDGE. They can go any distance as long as they stay in communications.

(Deletion by Department of Defense censor.)

Mr. HAMILTON. Do they search both below and above?

General PARTRIDGE. Yes.

[Deletion by Department of Defense censor.] I have shown you this picture and earlier one of a destroyer.

These are the means which the Navy is going to use to provide the barriers which I showed you in the Pacific and the Atlantic Oceans. [Deletion by Department of Defense censor.]

They will station destroyers on the surface every so many hundred miles, and they will fly these aircraft back and forth [deletion by Department of Defense censor], getting we hope sufficient density of coverage to prevent us from being surprised on the west coast.

A similar operation will take place on the east coast [deletion by Department of Defense censor].

So far we have been talking about detection, the use of radar for detection and the means for identifying aircraft. We identify practically all of the aircraft that fly by referring the plot by telephonic or teletype communications for coordination with the Civil Aeronautics Authority information.

INTERCEPTION AND DESTRUCTION

Now let's see what we use when we have to go to the interception and destruction phases. [Deletion by Department of Defense censor.]

The first type and the backbone of our force shown here is the F–86D, which was developed from the Sabre Jet used so successfully in Korea.

F–86D's

This is a single seater, has a radar dome on the nose shown at the right, carries twenty-four 2¾-inch rockets which are in a pod at the bottom of the airplane and which are fired automatically by the fire control equipment once the aircraft is properly positioned for the attack.

(Deletion by Department of Defense censor.)

Mr. HAMILTON. Are they all-weather fighters?

General PARTRIDGE. This and all the other aircraft I show you with the exception of the F–104 is an all-weather fighter. An all-weather fighter means simply that the fighter is equipped with radar which permits it to make an attack on another aircraft in the air by radar without visual reference.

In other words, the attack can be made at night or it can be made in bad weather.

Mr. HAMILTON. What is the ceiling on this aircraft, General?

General PARTRIDGE. Without being too precise, I can say it is lower than we would like to have it.

(Deletion by Department of Defense censor.)

F–94C's

Another aircraft we have in the inventory is also a single-engine aircraft, the F-94C. [Deletion by Department of Defense censor.] These are 2-seaters and they carry forty-eight 2¾-inch rockets, whereas the F–86D carries twenty-four.

A third model——

Mr. HAMILTON. What is the ceiling on this one?

General PARTRIDGE. It is about the same.

Mr. HAMILTON. Speed about the same?

General PARTRIDGE. Speed about the same.

Mr. HAMILTON. What is the difference between them?

General PARTRIDGE. One is a 2-seater, the man has the advantage of a radar observer who helps him with the radar.

Mr. HAMILTON. Are the rockets in both cases initially aimed?

General PARTRIDGE. The rockets in both cases are aimed by the pilot through use of radar. He does not have to see the target.

Mr. HAMILTON. I meant they are not guided?

General PARTRIDGE. No; they are unguided.

F–89's

The F–89 is present in the inventory in considerable numbers [deletion by Department of Defense censor], and what is shown here is one of the models. The wingtips in this case carry the 2¾-inch rockets. It has a very high-kill potential in that in each wingtip there are 52 rockets. It gives the capability of firing 104 rockets in a single salvo, if that is desired. The modification of this aircraft through another type—this is the D model—the H model will permit it to be equipped with Falcon which is a much improved and larger missile.

This is a semiseeking missile, an air-to-air missile, and the combat capability of the aircraft will be improved materially by the addition of Falcon.

(Deletion by Department of Defense censor.)

Mr. HAMILTON. What is its ceiling?

General PARTRIDGE. Just as I pointed out regarding the F–86's, it is lower than we would like to have it. [Deletion by Department of Defense censor.]

F–102'S

Another aircraft that is coming into the inventory starting this month that is being built for us by Convair, Consolidated Aircraft Corp. Here we get into a new family of fighters. This is a single-seater, quite a large airplane, but for the first time we have a supersonic aircraft.

In addition to that, it operates well at higher altitudes [deletion by Department of Defense censor], and as it comes into inventory will bolster our defensive capability in that respect.

Senator SYMINGTON. You have not named the airplane yet.

General PARTRIDGE. I am sorry; the F–102.

Mr. HAMILTON. Is it a day fighter?

General PARTRIDGE. It is an all-weather fighter as are all the others.

Mr. HAMILTON. And its altitude is up to what?

General PARTRIDGE. (Deletion by Department of Defense censor.) It is greater than that of the others mentioned so far. Also, when we introduce the Falcon [deletion by Department of Defense censor], we begin to pick up additional altitude capability based solely on our ability to shoot uphill, if you like.

FALCON

(Deletion by Department of Defense censor.) The Falcon is built for us by the Hughes Co. It is an air-to-air missile with a semiseeking head, if you understand that.

Mr. HAMILTON. Semiseeking, not guided?

General PARTRIDGE. It is guided by a radar set inside the missile. It is 6½ feet long, 6½ inches in diameter.

(Deletion by Department of Defense censor.)

May I talk off the record here just a minute?

(Discussion off the record.)

Senator JACKSON. On the record.

F–101'S

General PARTRIDGE. The next aircraft to come along is the F–101B. The picture shown here actually is the 101–A. It is a strategic fighter and the A differs from the B principally in the fact that the aircraft being built for us in the B configuration is a two-seater with all-weather interceptor capability.

(Deletion by Department of Defense censor.) This aircraft will operate at an altitude superior to the F–86 and approximating the F–102.

Mr. HAMILTON. It is supersonic?

General PARTRIDGE. It is supersonic, and this supersonic capability and the long-range combine to give us a far better air-defense weapon than we presently have in our inventory.

With the radius of action we presently have, it is possible generally speaking to get up and make one attack on a hostile bomber. With an aircraft of this sort, we can make several attacks and stay supersonic for a considerable period.

Mr. HAMILTON. You mean by "attack," a single pass?

General PARTRIDGE. Yes.

Mr. HAMILTON. How many of these will you have in operation?

General PARTRIDGE. [Deletion by Department of Defense censor.] None at this time.

Mr. HAMILTON. And when does the 102 come into the inventory?

General PARTRIDGE. The F–102 in its A configuration is coming into the inventory now and the first unit is being put together in California at George Air Force Base.

This aircraft that you see here and the later models of the F–102 will carry [deletion by Department of Defense censor] Falcons.

F–104'S

One other aircraft that is coming along, the F–104. This little fellow unveiled by the Lockheed Co. recently is of very high performance. [Deletion by Department of Defense censor.]

Mr. HAMILTON. Up to what altitude, sir?

General PARTRIDGE. We do not know just exactly how high it will go yet. [Deletion by Department of Defense censor.]

Mr. HAMILTON. But you do not know really what its maximum ceiling combat effectiveness would be?

General PARTRIDGE. No, sir; I do not. But it is a very high-speed aircraft. [Deletion by Department of Defense censor.]

When you measure that against the F–102, for example, [deletion by Department of Defense censor], then you will see that this is a very great advance.

Mr. HAMILTON. When will we be getting those into the operational units?

General PARTRIDGE. We do not have any in our inventory at this time. [Deletion by Department of Defense censor.]

Mr. HAMILTON. How many planes in a squadron?

General PARTRIDGE. 25. [Deletion by Department of Defense censor.]

It might be interesting to show you for comparative purposes the aircraft that the Canadians are operating north of our border.

CANADIAN AIRCRAFT

This is the CF–100, a 2-seater 2-engine aircraft built by Avro Corp. in Canada.

It is very good for their purposes in that it has long range [deletion by Department of Defense censor.]

The only difficulty is that the aircraft is of postwar design and it is quite slow. It is as slow as the aircraft which we have in our inventory at the present time.

The Canadians plan to change to a new model [deletion by Department of Defense censor], which is supersonic and strictly modern. I am sorry I do not have a picture of it. These then are the interceptors. They are all-weather interceptors with the exception of the 104.

MISSILES

All of our present-day aircraft are equipped with 2¾-inch rockets in varying numbers from 24 to 104, but we are going as rapidly as we can to Falcon air-to-air missiles and air-to-air rockets unguided [deletion by Department of Defense censor].

I have mentioned earlier that the Army Antiaircraft Command is a major part of our organization. I am speaking now as the continental air defense commander. [Deletion by Department of Defense censor.] The Army is converting as rapidly as it can to the Nike missile, turning over its antiaircraft guns to the Army National Guard where that is feasible.

NIKE

You are all familiar with guns, so I won't bore you with pictures of the gun-type weapons. I would like to show you this picture of eight Nikes as they appear for exhibition purposes.

If you will disregard the seven in the background for the moment, the Nike is raised for firing on its launcher. The black part is the launcher. The missile itself is the top part in white. It is about 21 feet long and the booster at the bottom is about 11 feet long. [Deletion by Department of Defense censor.] It has relatively short range, compared with air defense missiles now in development.

Mr. HAMILTON. Which model is this, General?

General PARTRIDGE. This is Nike 1.

(Deletion by Department of Defense censor.)

Mr. HAMILTON. And the numbers in a battalion?

General PARTRIDGE. I will get it for you.

Mr. HAMILTON. If you will, supply it for the record.

General PARTRIDGE. I never can remember that number. I will get you that.

(Deletion by Department of Defense censor.)

TALOS

In the Air Force we are also going to have some ground-to-air missiles. We think we need longer range than the Nike has, so we have adapted one of the Navy's missiles, the Talos, shown here in flight.

The black part at the bottom is the booster, the red part on the top is the missile itself.

The booster drops off after launching. [Deletion by Department of Defense censor.]

Mr. HAMILTON. How many in a squadron, sir, approximately?

Is that the size of a battalion?

General PARTRIDGE. I will get the figures for you. I have it but it is too much trouble to take your time to look it up.

BOMARC

Another missile [deletion by Department of Defense censor] is the BOMARC, which gets its unusual name from the Boeing Co. and the University of Michigan which carried out the early work on the project, BOMARC.

The missile shown here is on its launcher at Patrick Air Force Base. [Deletion by Department of Defense censor.]

Mr. HAMILTON. All of these will be operating under your direct command?

General PARTRIDGE. Yes, under my operational control.

Mr. HAMILTON. Or in command of the general who occupies your position?

General PARTRIDGE. Yes, under his operational control.

So much for the weapons then.

The next question is where are we going to put them?

DEPLOYMENT OF DEFENSE WEAPONS

I would like to turn to a deployment of the weapons for the defense of the continental United States and southern Canada.

(Deletion by Department of Defense censor.)

If we were to show the coverage on this chart, we would obscure the chart completely or almost completely, so I have left off the radius of action around each of those blue dots.

Mr. HAMILTON. In the aggregate they would give pretty good coverage for the whole of the country would they, sir, at least to the important targets?

General PARTRIDGE. They give reasonably good coverage for the vital parts of the country, for the vital targets in the country, and they have been deployed for that purpose.

[Deletion by Department of Defense censor.] They would give fighter defenses in all or nearly every location which is on that list which I showed you in the earlier charts [deletion by Department of Defense censor], but we are not depending solely on this fighter coverage, as I will show you in a moment.

Let's add on the [deletion by Department of Defense censor] Nike battalions [deletion by Department of Defense censor], and here I have introduced the radius of action of the Nike.

Then let's put on the [deletion by Department of Defense censor] Talos. [Deletion by Department of Defense censor.] In general we intend to put them in the areas shown by the green dots.

And lastly we superimpose [deletion by Department of Defense censor] BOMARC and we get the coverage which you see there.

Mr. HAMILTON. With the blue dots the coverage of the fighters at the present time or some future time?

General PARTRIDGE. No; the blue dots represent only the location of the bases.

Mr. HAMILTON. At the present time?

General PARTRIDGE. Not at the present time, no, because some of the squadrons which are presently in the Northeast, 1 or 2 in the Northwest, are going to have to be moved to provide better fighter protection for the Strategic Air Command.

(Deletion by Department of Defense censor.)

Mr. HAMILTON. Thank you.

General PARTRIDGE. It should be obvious to you that when you have a system that is as widespread as this one and as dependent on time as this one is, we must have some very good control machinery, and this is in fact the case.

INADEQUACY OF CONTROL SYSTEM

We should have, but we do not yet have it. Presently we are working by what is known as a manual system, a radar operator sits at a scope, he watches a strobe line go around and as a blip appears, a little spot of light appears on the scope, he takes his grease pencil and makes a mark.

If the next time or the time after the strobe, the line of light goes around, he gets another blip, he makes another mark, and he has a very short time in which to say this is a known aircraft or it is an unknown aircraft.

If he thinks it is an unknown aircraft, he takes the information as to the location of that blip on his radarscope, the height information which he gets from another instrument, and sends that data by voice or by teletype to an air defense control center.

Eventually, if it continues as an unknown, the information gets all the way up to my headquarters. But the point is that the system is presently manual. It depends on a man making a mark on a scope, interpreting that into an airplane, sending the information by manual means and finally if they send off a fighter, controlling that fighter by voice radio.

In this present day of congested communication channels, this is quite difficult. We have some improvements coming along which will improve the capacity of our present manual system by a factor of 2 or 3.

SAGE

In addition to that, we plan to go to another system called SAGE, the semiautomatic ground environment which is being built for us by combined effort of Burroughs, Western Electric, IBM, and the Massachusetts Institute of Technology.

The heart of our SAGE system is a computer in a direction center. This computer is technically called the FSQ–7 housed in a building 150 feet square, 4 stories high. The computer occupies one floor of that building.

(Deletion by Department of Defense censor.)

Now what does this thing do?

It takes all the information pertaining to the air defense problem, accepts it from the places shown symbolically on the left, and I will name them for you, a gap filler radar, a heavy radar, a height finder, Texas tower, airborne early warning aircraft, picket ship, ground observer corps, Civil Aeronautics Authority, and our own airfields.

In the case of certain of those facilities we can supply the data by automatic data transmission symbolized by the red lines. We will still have to use voice methods or teletype in other areas, other circuits symbolized by the green lines.

All the information comes into the direction center, is coordinated, remembered electronically, put on a memory drum. It can be called up individually, selectively by the officer in charge of the direction center or by the other officers working for him.

He is then able to evaluate the information and direct the air battle by sending out to the weapons we control the necessary instructions and information.

From the direction center he can [deletion by Department of Defense censor] direct his fighters [deletion by Department of Defense censor] keep in touch with the airfield, take an airplane off the airfield, send it off to battle, bring it back to the airfield, and bring it in for a landing.

We also supply information from the direction center for the very necessary Federal agency, the FCDA, Federal Civil Defense Administration, so that they can keep the population of the United States informed about the air battle itself.

All this information, practically all of the activity in the direction center takes place automatically. It is called semiautomatic because all the man does who is in charge of it is to indicate to the computer the kind of information he wants and then tell the computer what he wants to do with it.

The first test sector is presently set up and operating in Massachusetts at the Lincoln laboratories. The first operational center will be at McGuire Air Force Base in New Jersey. [Deletion by Department of Defense censor.]

Then the production installation will be stepped up.

[Deletion by Department of Defense censor.]

Mr. HAMILTON. When would the equipment as to the United States under the present program be completed, approximately?

SAGE TO BE COMPLETED IN FUTURE

General PARTRIDGE. According to the present program, we are on schedule.

Mr. HAMILTON. It will be partially operating, progressively operative, during this period? [Deletion by Department of Defense censor.]

General PARTRIDGE. Yes. [Deletion by Department of Defense censor.]

In general, we are working up the coast and across the northern part of the country with certain adjustments to take care of training and so forth.

Mr. HAMILTON. Improvement in the range of the radar would not necessitate any change in SAGE as I understand it?

General PARTRIDGE. Oh, no. Any improvements we make on the basic inputs to the SAGE system only increase the capability of the air defense system.

This then is the ground environment, the weapons and the control system in a very, very quick rundown.

It is an exceedingly complicated and expensive establishment, and I hope that we have made clear the function of the various parts which must go into the arrangement. When we started out to build an air defense system, we started out to build one which would be suitable to combat the TU–4.

We now have a good system to fight the TU–4. Unfortunately the Russians came along a little more rapidly than we had anticipated in their technical developments, and they introduced the jet bombers and the Bear more rapidly than was forecast.

PRESENT DEFICIENCY IN AIR DEFENSE

As a result, we find ourselves in the years 1957, 1958, and early 1959 in not too good shape with regard to our high-altitude and our low-altitude air defense.

We are trying to cover the gap in the low altitude with the Ground Observer Corps. We are anxious to bring in the F–102, for example, to help us with the high-altitude coverage and get along with the improvements on our radar.

We have a system in being today, however, the framework is there, and we see our way reasonably clear to the solution of the problem of building an effective air defense against any type of manned bomber which we now see on the horizon.

Where we forecast difficulty, however, is with the intercontinental ballistic missile.

Mr. HAMILTON. Before you get on to that, General, if I may, was I right in the impression I had that you said SAGE was being developed by International Business Machine, Massachusetts Institute of Technology.

General PARTRIDGE. It was conceived at the Massachusetts Institute of Technology. The computers are built by IBM. Much of the data processing equipment is built by Burroughs.

Mr. HAMILTON. Who operates it?

General PARTRIDGE. Nobody operates it yet but when it comes into being, the Continental Air Defense Command will operate it.

Mr. HAMILTON. What about the DEW line, is that the same?

General PARTRIDGE. The distant early warning line which you understand at the present time is not a responsibility of mine——

Mr. HAMILTON. I understand that is outside your jurisdiction, General.

General PARTRIDGE. Will be operated on contract by the Federal Electric Co.

Senator JACKSON. Division of I. T. & T.?

General PARTRIDGE. A subsidiary of I. T. & T.

(Deletion by Department of Defense censor.)

In order for you to understand the defense against the intercontinental ballistic missile, you must understand something about the characteristics of the missile itself.

Mr. HAMILTON. Before we turn to that, General, may I put to you a question that has been suggested to me?

With the elaborate warning defense system described, would you expect the same proportion of enemy planes to arrive over a target, the proportion to be the same or as large as it was in World War II?

General PARTRIDGE. Yes.

DEFENSE TECHNOLOGY IMPROVING

Mr. HAMILTON. I really think, Mr. Chairman, with your indulgence, that Senator Duff, if he asked this, might help clarify it.

Senator DUFF. With the elaborate defense system you have described, wouldn't you intercept a number of planes before they got to the target—more than you did on a mission in World War II?

General PARTRIDGE. I misunderstood your first question, the implications of it.

You have heard General LeMay explain that in Europe in World War II we lost roughly 2 percent and that in Korea this was much less.

He could have chosen some different statistics if he wished.

For example, in the Mediterranean after we got the air defense beaten down we were able to operate with losses no greater than one-half of 1 percent per sortie.

In other words, if you sent out 200 bombers, the chances were that you would lose 1.

We believe that the air-defense system which we are setting up will be far more effective, infinitely more effective than anything built in World War II.

The introduction of the SAGE system alone will increase the capability of our air-defense system by a factor of something like 5 to 10.

We don't know just how much because we have not tried it yet. But we will reduce to automation practically every essential step in the air-defense process.

Instead of a man watching a scope, for example, the scope is scanned automatically by another tube, and the data extracted and sent automatically from an unattended radar to the central direction center where an officer can screen out what he does not want and use the rest by just pushing buttons. This step-up is terrific.

Then when you add to that seeking missiles which we will carry on our aircraft. [deletion by Department of Defense censor] modern warheads and a few other improvements, you see that the air defense we are talking about today is a far cry from the best that could be set up technically in World War II.

PERCENTAGE AND STRENGTH OF ENEMY PENETRATING OUR DEFENSES

Senator SYMINGTON. As long as the Senator has asked that, may I ask a question here, Senator Duff?

Senator DUFF. Yes, sir.

Senator SYMINGTON. Just to clarify. In May 1941 the British got more than 5 percent of the Nazi bombers and thought the raids would stop as a result and they did stop. They never had another quantity raid on England until the V–1 and V–2's several years later. Under your system, as you analyze it, you would much reduce the percentage that would get through; correct?

General PARTRIDGE. Quite correct.

Senator SYMINGTON. On the other hand, if one gets through with a hydrogen bomb you have lost your city; have you not?

General PARTRIDGE. Quite correct.

Senator SYMINGTON. On the maximum basis as things now stand with your defense, what percentage do you think you could knock down of an attacking force?

Take the averages either way.

General PARTRIDGE. Senator, I wish I could answer that one. I do not know the answer to that one.

As many as possible, that is the only answer I can give to you that answers that one, but I am sure that the enemy, if he attacks, will find us much more able to cope with him than we were even 5 years ago or even 2 years ago.

Senator SYMINGTON. Can I pursue that with you a minute?

General PARTRIDGE. Yes.

Senator SYMINGTON. Do you think you could knock down 50 percent of the attacking force?

General PARTRIDGE. I would not hazard a guess.

Senator SYMINGTON. 75?

General PARTRIDGE. The way to evaluate our air-defense system is to try to think of it as insurance which you carry for years and hope the house will not burn down.

Senator SYMINGTON. General LeMay emphasized the vital importance of warning, to him, if he is going to have anything left with which to retaliate; so there is no question about the tremendous advisability of having every method possible for detection. I was wondering if you had a percentage, in answer to Senator Duff's leading and important question.

Do you think you could knock down 90 percent?

General PARTRIDGE. I don't know.

Senator SYMINGTON. You just don't know what you could do?

General PARTRIDGE. No, sir; I have no basis on which to guess, but as long as the system, the line of questioning has been opened up, I might add one point which I did not include in my statement in its preparation and which I probably should have. There is a terrific difference to the enemy between operating against some defenses and operating against no defenses.

If the enemy knows that we have no defenses, he can come in, cruise around the country, go anywhere he wants to, bomb one airplane at a time. If he does not like one approach, he can go around and make another one. He could use his fighters and just strafe up and down the streets, do anything at all.

On the other hand, if he knows we have some defenses, no matter how meager they may be, he must do many, many things which General LeMay so very effectively outlined on his chart. He must use large formations or large numbers of bombers, and he must come at night and in bad weather and so on and on and on, carry defensive weapons, perhaps carry fighters with him and so on. So his offensive capability is tremendously degraded just by the fact that there is an air defense, even if we shoot down not one bomber.

Senator SYMINGTON. Now one final set of questions.

You do not underrate the Soviet scientific capacity, capabilities; do you?

General PARTRIDGE. No, sir; I think they have demonstrated time and again that they are making progress at a rate which exceeds our expectations.

Senator SYMINGTON. General LeMay said he felt, even if they would hit us with an effort at a sudden surprise attack, that he could get up off the floor, and in turn ram through their defenses and destroy their cities.

He has so testified. At that point they would be completely on the alert. We know they have thousands more jet fighter planes than we have. They have done a great deal of work in radar. They have done a great deal of work in interception. As I understand it, we have pictures of their installations comparable to Talos, Nike, Bomarc, and so forth, around Moscow.

Is it the feeling of our Air Force that we could rise from sudden devastating atomic attack, and get through their defenses, and destroy them? If they hit us in a sudden surprise attack they would get some of their planes through against us, would they not?

General PARTRIDGE. Oh, yes; I feel certain that if the Soviets make a strong attack against this country, some of their aircraft will get through.

My job is to make the number included in "some" as small as possible.

Senator SYMINGTON. Senator Duff, as long as you and I have asked questions, I ask Senator Jackson, have you any questions along these lines you would like to ask?

Senator JACKSON. What would happen if the Soviets today sent down directly over the polar cap 40 Bisons flying at maximum altitude? What would we do, what would happen?

General PARTRIDGE. The trick is to catch them before they get maximum altitude, if it is possible to do so.

Senator JACKSON. Where would we pick them up today?

General PARTRIDGE. The chances are pretty good that if they came across there, we would detect them if they came from the northeast, on that side——

Senator JACKSON. No; this is straight down the middle, right over the top, right down the middle. They are going to approach east of Barter Island, right down the middle.

General PARTRIDGE. I hope they will come on a day when there are condensation trails and the Ground Observer Corps of the Canadians will pick them up. This is what happened in one of the SAC exercises of recent months, and we had several hours, over 5 hours warning simply because the aircraft had to circle up there and were detected by people on the ground.

(Deletion by Department of Defense censor.)

WOULD FIGHT WITH WHAT WE HAVE

Senator JACKSON. And what could you send up to intercept them?

General PARTRIDGE. I am sure we would stagger off with whatever happened to be handy, and I hope they would come through where the Falcons are, because we can shoot uphill with those.

Senator JACKSON. That is the reaching up process?

General PARTRIDGE. Yes.

DISTANT EARLY WARNING SYSTEM INCOMPLETE

Senator JACKSON. What I am leading up to is, of course, the DEW line. Until we get the DEW line, they have a big hole [deletion by Department of Defense censor]; is that right?

General PARTRIDGE. I agree, in the radar defenses, certainly.

(Deletion by Department of Defense censor.)

Senator JACKSON. We will have Mid-Continents coming in.

[Deletion by Department of Defense censor.] That is all.

Senator SYMINGTON. Senator Ervin?

Senator ERVIN. No questions.

Senator SYMINGTON. Will you proceed, General?

Senator JACKSON. I am not being critical of what you are doing. I am just trying to point out how difficult your problem is.

General PARTRIDGE. Yes, sir. I have tried to state several times that I consider our coverage at high altitudes for air-defense purposes is not as good as it should be for the security of the country.

Senator SYMINGTON. Senator Saltonstall, we have opened up for questions on attack and defense before getting into the missiles.

Senator Duff asked a question, I asked questions, Senator Jackson asked questions. Have you any questions you would like to ask now?

Senator SALTONSTALL. No, sir; I will read the record. I prefer not to at this time.

INTERCONTINENTAL BALLISTIC MISSILE

General PARTRIDGE. I pointed out that the defenses which we are equipped with today or which we are planning—which we can see on the horizon—take care of the Soviet threat up through the manned bomber, but the Soviets are said to be building an intercontinental ballistic missile, and we must somehow devise a defense against this type of attack.

In other words, for you to understand the severe requirements that such a missile places upon the air-defense system, let's look at the missile itself and see what its characteristics might be.

If it were fired from Russian bases, it is going to have to travel about 3,000 or 5,500 miles, something of that order. It will probably start off with a booster which will drop off, and it will be under, the missile will be under, power and guidance for 400 to 500 miles.

At that point the power will shut off and the missile will continue with a speed about 20 times the speed of sound, so that it will arrive over at its destination in about, certainly not more than 30 minutes, maybe less than that, having achieved an altitude en route of about 500 miles.

The reentry problem also imposes a severe limitation on the enemy's missile, but our scientists say that that can be solved and certainly we plan to solve it in this country.

So essentially we have to do something about an object which appears suddenly in the sky which goes to an altitude of about 500 miles and goes at a speed of Mach 20. Let's see what we can do about this.

[Deletion by Department of Defense censor.]

Personally this seems an almost insoluble problem, but our scientists say it can be done and that we should be getting along with it.

My point of view is that the threat of Soviet attack by ICBM is so frightening to me that we just cannot afford to put less effort into the defense than we can into the offense.

Maybe we can, but it is my point of view that we at least must have a solution for this type of attack.

We are studying the problem. We are making preliminary estimates on what is required in the way of hardware and locations, communications, and antimissile and so on, but we still do not have a workable solution.

Mr. HAMILTON. You mean even in principle?

General PARTRIDGE. In principle we have one according to the scientists, but it has not yet been translated into any hardware, and

until we can prove out the components and figure out a way to make the thing work operationally, I do not rest very easy.

Mr. HAMILTON. Do you have any guess as to the length of time that would take or is that in terms of the effort that is applied to it?

General PARTRIDGE. I am not sure how long it will take. I am not familiar with the specific facts on the research effort.

Mr. HAMILTON. As to how much has been done?

General PARTRIDGE. No, sir. My information is general rather than specific. At the start of the talk I promised to talk to you about the limitations which we encounter in trying to make our system fully effective.

If you have time I should like to cover that this afternoon.

Senator SYMINGTON. General, could you come tomorrow?

I know Senator Saltonstall has a date at the White House. He is through by 10:30. Could you be with us tomorrow from say 11 to 12:30?

General PARTRIDGE. Certainly.

Senator SYMINGTON. We can go until 10 minutes of 5 or thereabouts, so you have another half hour.

Senator SALTONSTALL. You can continue without me.

Senator SYMINGTON. No, I prefer not to.

Senator JACKSON. On this same point is it planned to meet tomorrow afternoon?

Senator SYMINGTON. Yes, 2 o'clock in open session.

Senator JACKSON. The General is scheduled to meet with our committee so we will change that over to Wednesday.

General PARTRIDGE. I am going to stay here anyway, so any time this week at your convenience.

Senator SYMINGTON. Then we will plan also 11 to 12:30 tomorrow in this room here in executive session, and then we will continue in the afternoon after General LeMay. Then we will get some questions together and talk about how we handle that for an open session.

Will you proceed?

LIMITATIONS OF OUR DEFENSE

General PARTRIDGE. As we have gone along with the help of several very excellent questions, I have been able to outline to you some of the limitations on the system which we are operating at the present time. We need additional radars and we need to improve the capability of the radar equipment which we already have.

The aircraft presently in the inventory are subsonic and of insufficient altitude performance.

NEED MODERN WEAPONS NOW

We need to bring into the inventory as rapidly as possible better aircraft and new guided missiles with improved range, particularly Talos and Bomarc.

Even in our present-day interceptor aircraft the unreliability of our fire-control equipment downgrades our capability to achieve full operational effectiveness.

I described to your counsel this morning and it might be well for me to describe again the manner in which an interceptor actually carries out an attack.

Mr. HAMILTON. I think that might be interesting to the gentlemen on the committee.

INTERCEPTION TRAINING

General PARTRIDGE. We do our training at a couple of southern stations, one at Yuma and one near Panama City, Fla.

We fire at flags which are radar reflective and which are towed behind aircraft at certain altitudes on the range, fixed altitudes and on a fixed course.

The target aircraft and its target are both controlled by a ground controller, a man sitting at one of those radar scopes and watching where the target aircraft and target itself go.

A fighter takes off with rockets to attack this target. He takes off, he may be flying by himself or he may have a radar observer. In any event, he will have a chase plane following him for safety purposes.

The interceptor takes off, climbs to about 10,000 feet and then the pilot covers himself with a hood. From then on until he is told to open the hood, he sees nothing outside the aircraft. He sees only the radar equipment which is presented to him by a radar scope.

The ground controller tells the pilot of the single seater interceptor where to go, turn right, turn left, climb, so on. He positions the attacking interceptor on a beam of the target, in other words alongside of the target, tells him to turn into the target, and at that point turns the control of the problem over to the pilot of the interceptor.

The pilot locks on, locks his radar on the target to be attacked, presses the trigger and at the proper moment, and I do mean moment, the fire control equipment fires the rockets, and the interceptor pulls out.

This is done entirely under the hood without visual reference outside the cockpit. The pilot is then directed toward his home base, comes out from under the hood and goes in to make the landing.

Perhaps this will highlight the fact that since we are attacking at 90 degrees, the target may be going as fast—in combat would be going as fast—as 600 miles an hour or thereabouts.

You can see that the fire-control equipment must be peaked at a very high state of effectiveness.

When it is peaked it works all right but we need two things that we have difficulty in getting now.

One we need reliability in the system itself, second, we need the finest mechanics that we can find anywhere to keep the system going.

Mr. HAMILTON. General, you said the speed of the target in combat might be 600 miles an hour?

General PARTRIDGE. Yes.

Mr. HAMILTON. At what speed do you tow your targets?

General PARTRIDGE. They tow at 200 knots, simply because they cannot get any target to stay on the tow cable and the plane fly any faster. The thing whips to pieces and they come down with just a piece of target.

NEED BETTER ENGINES

We have an urgent requirement—returning to my script—we have an urgent requirement to produce for air defense purposes new aircraft with far better engines than any we have now so that we can cope with the threat of the enemy high-flying, high-speed bombers not

only of the manned variety but also of the unmanned variety such as the Navaho and Snark.

Mr. HAMILTON. Pardon me for one additional point in connection with your target practice.

When the rockets are fired from our present planes, are they triggered manually or triggered by radar?

General PARTRIDGE. They are fired automatically by the fire-control equipment at the proper distance [deletion by Department of Defense censor].

I did not listen to General LeMay's talk on personnel, but I have heard his talk before and I should like to echo what he says about personnel.

SHORTAGE OF SKILLED PERSONNEL

One of the limitations on the air-defense system is that we have difficulty getting skilled technicians and we also have trouble in keeping our young officers.

They come with us, the officers come with us, serve their minimum required tour and then leave. Anything that the committee can do to stabilize our personnel situation will be most productive in the air defense field just as it is in the Strategic Air Command.

We have a different situation in the personnel field in one respect and perhaps it would be well for me to mention it.

We are essentially fixed base operators. We are not going anywhere. We are given bases in the United States. We put our forces there and there we stay. We do, however, have a very extensive system, and it is getting bigger every day. We have a great many radar stations, communications points, and so on. Many of these jobs which we have lend themselves to the employment of civilians. We have made studies on this and we could use thousands of civilians in the Air Defense Command in place of military if we could get authorization to raise our ceiling in the Air Force or to get more money for civilian people.

You know more about this than I do, Mr. Chairman.

Senator SYMINGTON. No, I do not, General, but I am intensely interested in what you just said.

General PARTRIDGE. We have a ratio now of about 8 to 1 military as against civilian.

I do not know exactly what ratio we should strive to achieve, but it seems more nearly of the order of perhaps 1 to 1 or 3 to 2 or something of that sort.

Mr. HAMILTON. What are the factors that establish that ratio now, General?

LIMITATIONS AGAINST PERSONNEL ADEQUACY

General PARTRIDGE. Merely my capacity to talk out of the Air Force—the people in the Air Force who allot the civil personnel, the additional number required to carry on the function.

Senator SALTONSTALL. Will the chairman yield on that?

Senator SYMINGTON. Yes, provided we can all ask questions.

Senator SALTONSTALL. I just wish to help the counsel. I won't say anything.

Senator SYMINGTON. No, I would appreciate it.

Senator SALTONSTALL. I think they are limited by the statute advanced by Senator Byrd a few years ago which limits the number of civilians that can be employed in the military establishments.

Mr. HAMILTON. General, do you know what the source of the limitation is, or do you just meet it when you talk to the Air Force?

General PARTRIDGE. I meet it when I say give me another 4,000 civilians. They say I am sorry, we don't have any more spaces, civilian spaces, to allot to you.

Mr. HAMILTON. I will check on that and see.

Senator SYMINGTON. May I ask a question there?

Senator SALTONSTALL. Certainly; you are the chairman.

Senator SYMINGTON. There is a military ceiling of so many people in the Air Force, is there not?

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. And that ceiling is established by the Department of Defense, is it not?

General PARTRIDGE. I am not sure how the ceiling is established.

Senator SYMINGTON. Will you find out how it is and let us know at the next hearing?

General PARTRIDGE. Yes.

Senator SYMINGTON. What I would be interested in is the Byrd amendment or the Byrd bill—does that have to do with a percentage of the ceiling or does it have to do with a flat-out figure as against military?

Do you happen to know that?

General PARTRIDGE. No, I do not.

Senator SYMINGTON. General Musgrave, will you find out about that?

General MUSGRAVE. Yes, sir.

Senator SYMINGTON. Is there a ceiling established by the Department of Defense as to how many people are in the Air Force?

General MUSGRAVE. Yes, sir.

Senator SYMINGTON. And is the percentage of civilians, a percentage of that, the number of civilians, an established ceiling or is it a matter of legislation in numbers?

Is it legislation in numbers or legislation in percentage, and when was the legislation passed? If you could get a copy of it we would appreciate having that.

Thank you.

Senator Jackson?

Senator JACKSON. No questions.

Senator SYMINGTON. Senator Duff?

Senator DUFF. No questions.

Senator SYMINGTON. Senator Ervin?

Senator ERVIN. No questions.

General PARTRIDGE. You appreciate the fact that in changing over from military to civilian, we have many other factors to take into account than merely a transfer from one category to another.

There are certain limitations on the employment of civil-service people in what might be termed "combat positions."

There are certain requirements within the Air Force to have people in the United States who can be utilized for rotation purposes with

people doing similar duties overseas. There are many facets to the problem but I believe it is a productive area in which to work.

MORE CIVILIANS NEEDED

Senator JACKSON. I do have one question.

As we get into complicated weapons, technology, defensively and offensively, doesn't it make some sense to try to get more and more civilians in these positions, especially where you are dealing with the maintenance of equipment and dealing with the long-term problem of training?

General PARTRIDGE. Yes, indeed, it does, either by contract or by having the civilians on the civil-service side so that they can remain with us on an extended basis.

What we are trying to do is reduce the turnover in the people.

Senator JACKSON. Right. That is the reason why I mentioned that. There should be a greater emphasis in those areas on acquiring civilian employees where you want to maintain continuity, particularly.

The problem is that you train a sergeant and a technician and you spend most of the time training him and then he leaves.

General PARTRIDGE. That is quite true.

CONSTRUCTION NEEDS

Perhaps one of our most serious difficulties, and this is one also mentioned by General LeMay, is the matter of construction.

It is a long involved process to go from statement of requirement in the field by a field commander to actual possession of the building.

Furthermore the introduction of new weapons and new equipment, new weapons like Talos, for example, Bomarc, requires sums of money for construction which far surpass anything which we have asked for previously in the Air Defense Command.

In the field of radar we have many new pieces of equipment to be put in place and we require expedited construction to get it into place to meet this threat which is coming along in 1958 and 1959.

This is particularly true when we are talking about radar for the intercontinental ballistic missile. [Deletion by Department of Defense censor.]

It is going to be complicated and it is going to cost a lot of money.

Our Sage system is costing very large sums for construction purposes alone, disregarding the equipment. [Deletion by Department of Defense censor.]

CONSTRUCTION FUNDS SHORT OF REQUIREMENTS

All of these add up to very greatly increased requirements for construction, construction funds.

I would like just to give you an order of magnitude of the kind of money we are talking about.

In 1955 we asked for 321 millions of dollars. We actually received 139. I hasten to say that this is not the fault of Congress necessarily, probably not.

I am a field commander. I put in my requirement. I think it is $321 million, but in the long process of review, discussion in Congress, appropriation, apportionment and so on, we actually get far less in most cases than we think we need.

Probably this is a good thing in many ways because it provides a check on useless expenditure. But in some cases, and I think we are at that stage now, when we are changing over from one sort of a system to another we have to have very greatly increased appropriations and they are hard to get simply because we did not get them last year.

Anyway, in 1955 we asked for $321 million and got $139 million.

In 1956, the following year, we asked for $421 million and we received $344 million.

We did rather well that year. But in 1955 we asked for $509——

Mr. HAMILTON. You mean 1957, General? You said 1955.

General PARTRIDGE. Yes. In 1957 we asked for $509 million and I am told we are to receive only about $268.

In 1958 we are asking for $758 million, and of course we don't have any idea how much we will get toward that requirement.

But perhaps this will give you some measure of the magnitude of the sums we have to ask for for the United States—and I am not counting the DEW line or the mid-Canada line or any of those installations outside the United States because I am not responsible for those—$321 million in 1955, $758 millions in 1958, an increase of about two and a half times.

In summary then, let me say that we do have in the United States an operational air defense system that runs 24 hours a day. There are fighters on alert ready to scramble this second anywhere where we have fighter squadrons located, usually 2 are on 5-minute alert at each fighter squadron location.

In addition we have 17 National Guard squadrons, 1 Navy squadron operating every day, the Navy squadron 24 hours a day, the National Guard squadrons only in daylight good weather, but these resources are available to my operational people and the fighters themselves can be sent off immediately armed, equipped, ready to shoot.

Mr. HAMILTON. Pardon me for interrupting.

Question has been raised whether these figures you gave us related to your overall request for funds for all purposes or simply related to your request for bases.

General PARTRIDGE. These relate solely to the military construction program, some of them bases, some of them radar sites, some of them improvements.

Mr. HAMILTON. They do not include equipment or maintenance and operation funds or personnel?

General PARTRIDGE. No; they do not. We have other weapons on the alert as well, Nike and antiaircraft artillery.

They are constantly on the alert and ready to fire it if called upon to do so.

IMPROVED WARNING SYSTEM URGENTLY NEEDED

We are extending our ground environment to the north because we realize that better warning is a must. It is most essential that we get better warning, particularly for alerting SAC.

(Deletion by Department of Defense censor.)

Mr. HAMILTON. How many squadrons in a wing?

General PARTRIDGE. Three squadrons in a wing but we do not operate that way simply because we have to be spread around the United States.

ONE HUNDRED AND THIRTY-SEVEN WING PROGRAM

Mr. HAMILTON. Where does your organization fit into the 137-wing program?

General PARTRIDGE. We are considered to have 21 wings at the present time [deletion by Department of Defense censor]. We will have 23 and a fraction.

Mr. HAMILTON. Wings?

General PARTRIDGE. Wings.

Mr. HAMILTON. Does that entail increase in the 137-wing program?

General PARTRIDGE. No, sir.

Mr. HAMILTON. Or is your expansion within that?

General PARTRIDGE. This is expansion within the 137-wing program.

Mr. HAMILTON. Is that up to what the 137-wing program contemplated then?

General PARTRIDGE. Yes.

Mr. HAMILTON. That is, your expansion is coming up to the 137-wing program?

General PARTRIDGE. Quite correct. We are following the 137-wing program exactly.

Mr. HAMILTON. So that prior to your expansion you would not have been up to strength?

General PARTRIDGE. No.

[Deletion by Department of Defense censor.]

If we happen to get any more squadrons, they will come to us by means of a transfer from another organization.

SHOULD BE ABLE TO DEFEND AGAINST SOVIETS MORE EFFECTIVELY IN A FEW YEARS

New missiles, new fighters are coming into the inventory and we should be able to operate effectively against the Russian Badger, the Bison, and the Bear as well as the Bull as soon as these new weapons are with us.

Mr. HAMILTON. And when would that be, sir?

General PARTRIDGE. [Deletion by Department of Defense censor.] In a few years. Our capability is growing all the time.

As a matter of doctrine, we believe that the best defense is a good offense, and we believe that our primary mission in the Air Defense Command is to defend the bases from which the Strategic Air Command is going to operate [deletion by Department of Defense censor].

We believe also that we have to provide a reasonable, an equitable protection for the key facilities, the population centers and our industry.

STRONG DEFENSE CAPABILITY IS A DETERRENT

We believe, however, that our primary objective is to convince the enemy that he should not attack, and if we can deter the enemy from attacking, we have achieved a 100-percent air defense.

I should like to add—that is not in the script either—I should like to add that the opinions expressed are my own and I talk to you as a commander in the field, not necessarily from the point of view of Air Force headquarters.

Senator SYMINGTON. Thank you very much, General.

I have been around this town some years and have never heard a better briefing than you gave today.

It has been clear and concise.

I am sure that the committee members and the counsel will want to ask you questions.

We look forward to seeing you tomorrow in this room at 11 o'clock.

(Whereupon, at 4:50 p. m., the committee was adjourned.)

STUDY OF AIRPOWER

TUESDAY, MAY 1, 1956

UNITED STATES SENATE,
SUBCOMMITTEE ON THE AIR FORCE
OF THE COMMITTEE ON ARMED SERVICES,
Washington, D. C.

The subcommittee (consisting of Senators Symington, Jackson, Ervin, Saltonstall, and Duff) met, pursuant to recess, at 10:10 a. m., in the Old Supreme Court Chamber, United States Capitol, Senator Stuart Symington (chairman of the subcommittee) presiding.

Present: Senators Symington (presiding), Saltonstall, and Duff.

Also present: Senator Welker.

Fowler Hamilton, general counsel; Ramsay D. Potts, Jr., associate general counsel; Fred B. Rhodes, legal consultant to Senator Saltonstall; Edward C. Welsh, assistant to Senator Symington; and Wallace L. Engle and Ronald Friedenberg, staff members.

Robert M. Pennoyer, Office of General Counsel, Department of Defense; Brig. Gen. Frank E. Rouse, Headquarters, USAF; Capt. S. S. Searcy, Assistant Director, Progress Analysis Group, United States Navy; Col. C. E. Scott and Col. J. F. Kirkendall, aides to General Partridge; and Lt. Col. Donald S. Bussey, Office of Deputy Chief of Staff, Operations, United States Army.

Senator SYMINGTON. We will call to order this meeting of the Subcommittee on the Air Force of the Senate Armed Services Committee.

Before we proceed, I wish to make a short statement.

This is a sad day for the United States, and especially for those of us in the Senate.

Senator Alben Barkley was a very great statesman who cannot be replaced. He had our love and respect.

All of us will miss him. Our deepest sympathy goes to his wife and family.

Inasmuch as this committee now has in Washington 2 of the 3 top field commanders of the Air Force, and inasmuch as many of us will want to attend the services for Senator Barkley tomorrow, and the services in Paducah on Thursday or Friday, after consultation with the Secretary of the Senate it had been decided that we would proceed with the hearings today; and, out of respect for his memory, cancel those scheduled for the rest of the week.

One of the reasons leading to this decision is the expressed wish of General LeMay to, if possible, return to his command this evening.

Senator Saltonstall, have you any comments?

Senator SALTONSTALL. Mr. Chairman, I believe that your decision, the decision of the Chair, is a wise one, and one that would meet with

our approval and meets with our approval. because of our friendship and our respect for the late Senator Barkley, whom we all knew as a Senator and as a man and as a patriot.

Senator SYMINGTON. Senator Duff?

Senator DUFF. I considered Senator Barkley one of the outstanding men of our generation. I had great admiration and affection for him, and I am supremely sorry that we have lost him here.

Senator SYMINGTON. Mr. Counsel, I note that General Partridge is the witness, General, you will please consider yourself sworn as of yesterday.

Mr. Counsel, will you proceed with any questions you have of the witness?

Mr. HAMILTON. I am pleased to do so.

TESTIMONY OF GEN. EARLE E. PARTRIDGE, COMMANDER IN CHIEF, AIR DEFENSE COMMAND AND CONTINENTAL AIR DEFENSE COMMAND, UNITED STATES AIR FORCE—Resumed

Mr. HAMILTON. General, I would like, if I may, to address your attention first to some general questions. I wonder if you would mind stating again for the record your general view on two points:

One, how efficacious defense can be, as a practical matter, against a strategic nuclear air attack; and then, after that, your view of the role of defense, so to speak, where it can make its best contribution to the defense of the country.

The first point is really one of how strong and how effective it can be; in other words, what is the best defense.

EVEN WITH ADEQUATE RESOURCES SOME ENEMY BOMBERS WOULD PENETRATE

General PARTRIDGE. The Air Defense system can, if we put enough resources into it, be extremely effective in actually shooting down hostile aircraft invading our airspace.

I doubt that even if we put all of our air defense, all of our national defense dollars into air defense, all our national efforts into air defense, we could prevent all the bombers from getting through.

However, the effectiveness of our air defense is increasing by leaps and bounds by the introduction of Sage equipment, the guided air-to-air missile, the Falcon [deletion by Department of Defense censor].

We are also introducing new ground-to-air missiles on the Air Force side, Talos, Bomarc; and since these have longer range, their contribution to air defense will be very, very great.

Even with all these weapons, I don't believe it is possible to say we will shoot down 100 percent of the incomer, however, and I believe we must be prepared to accept major damage, severe damage, if the enemy does attack.

Mr. HAMILTON. Even after all of these arrangements have been completed?

General PARTRIDGE. Yes.

Mr. HAMILTON. Yes.

STRONG DEFENSE IS A DETERRENT

General PARTRIDGE. Our major contribution to the protection of the country is an intangible one. If we can make our defenses so strong that it will give the enemy pause and prevent him from deciding to

launch an attack, then we have right there carried out a very major part of our mission.

Mr. HAMILTON. You mean it would have a deterrent effect?

General PARTRIDGE. Yes.

PROTECTION OF SAC

Mr. HAMILTON. I believe you said yesterday that you regard as one of your important responsibilities the protection of SAC.

General PARTRIDGE. Yes. In the actual mechanics of carrying out air defense, we devote a great deal of our effort and attention to the protection of the Strategic Air Command's striking force on the base, bases which it occupies in the United States.

Mr. HAMILTON. Is that because you believe retaliatory power of SAC is the principal kind of defense——

General PARTRIDGE. Yes.

Mr. HAMILTON (continuing). In the country, sir?

General PARTRIDGE. Yes; that is true.

Mr. HAMILTON. General, I wonder if you would care to comment on the relative position, if you feel you are qualified to do so, that we have vis-a-vis the Russians with respect to such matters, for example, as radar. Is their radar as good or worse or about equal to ours at the present time, would you say?

SOVIET RADAR COMPARABLE TO OURS

General PARTRIDGE. I would say that technically their radar is comparable to ours. They are able to do things, however, which we are not, because they use so many people. They keep very large numbers of radar sets operational; and this, of course, is possible because they have in the Soviet Union about 550,000 people engaged in air defense.

Mr. HAMILTON. How many, sir?

General PARTRIDGE. 550,000, sir.

Mr. HAMILTON. As compared with how many that we have engaged?

General PARTRIDGE. 130,000, 140,000, something of that order.

Mr. HAMILTON. At the technical level, how do their people who are technicians compare with ours, would you say?

General PARTRIDGE. I have no information on that.

Mr. HAMILTON. What about the extent of their radar coverage? Do they have as good radar coverage around the periphery of Russia as we do around the periphery of the United States?

General PARTRIDGE. No, I don't believe they do; but in the critical areas they have very good coverage. My experience is more oriented toward the Far East.

Mr. HAMILTON. You served out there, didn't you, General?

General PARTRIDGE. I am sorry?

Mr. HAMILTON. You served in the Far East?

General PARTRIDGE. Yes.

Mr. HAMILTON. During what period of time was that?

General PARTRIDGE. From 1948 to 1951, and again in 1954 and 1955.

Mr. HAMILTON. Did you have a command during the Korean war?

General PARTRIDGE. I commanded the Fifth Air Force during the start of the Korean war. Their radar defenses in the Far East are excellent, showing they had mastered the latest technological advances in this field. [Deletion by Department of Defense censor.]

Senator SYMINGTON. If I might interrupt just a minute.

Actually, you commanded the Air Force during the Korean war: that is correct, is it not?

General PARTRIDGE. I commanded the Fifth Air Force.

Senator SYMINGTON. Yes.

General PARTRIDGE. The Air Force that was in Korea was under my command.

Senator SYMINGTON. Yes, at the top.

Mr. HAMILTON. Was I right in the impression I had, you said their radar had longer range than ours did, General?

General PARTRIDGE. They were able to report and detect our aircraft in the Far East at ranges greater than my own radar would perform the same function.

Mr. HAMILTON. I see.

General PARTRIDGE. We did not, however, have the latest radar in the Far East. The Russians did.

Mr. HAMILTON. Do you mean they had radar that was later than ours, or they had their own latest radar?

General PARTRIDGE. They had radar that was technically better than ours in the Far East.

Mr. HAMILTON. I was just wondering whether you knew whether or not they had any radar on research, and so forth, that was better.

General PARTRIDGE. No, I don't know.

SOVIET MISSILE DEFENSES

Mr. HAMILTON. What about missiles? Do you know whether or not their defensive missiles at the present time are comparable to ours or inferior to ours?

General PARTRIDGE. I am not qualified to say. We do know that they have missile defenses in the Moscow area, but just what they are, I am not——

Mr. HAMILTON. Do you have any judgment as to whether or not the number of their missiles is equal to, less than, or more than ours?

General PARTRIDGE. No, I do not know.

QUALITY OF SOVIET AIRMEN

Mr. HAMILTON. What about their crews, General? Did you have any experience in the quality of their fighters, pilots, in Korea?

General PARTRIDGE. I don't think it was ever definitely established that these aircraft we were opposing were flown by the Russians. They spoke Russian, but they might have been Chinese speaking Russian. We never did recover a Russian body, for example.

Mr. HAMILTON. You didn't?

General PARTRIDGE. No.

Mr. HAMILTON. Would you have any views as to the relative quality of the maintenance in the Russian defense force as compared with our own, sir?

General PARTRIDGE. No.

SOVIET FIGHTERS SUPERIOR NOW

Mr. HAMILTON. Are you familiar with their fighters, General, with the Russian fighters in their defense system?

General PARTRIDGE. Just in a general way.

Mr. HAMILTON. Interceptors?

General PARTRIDGE. Yes.

Mr. HAMILTON. Addressing your attention to the fighters we now have in operation, would you have any judgment as to whether they are superior or equal to or inferior to the Russian fighters?

General PARTRIDGE. I would say that at the moment, the latest Russian fighters are slightly superior to ours.

Mr. HAMILTON. I am talking about those that are in operation now, sir.

General PARTRIDGE. Yes, sir; in operation in air defense.

Mr. HAMILTON. Yes, sir.

General PARTRIDGE. In air defense. Now, the F–100 in tactical use is comparable to the latest Russian fighter, perhaps a little better, probably a little better.

Information of this sort, however, would be far more authoritative if you got it from the technical intelligence folks than getting it from me. These are merely opinions on my part.

SUPERSONIC BOMBER

Mr. HAMILTON. Are we planning our defenses down the road upon the assumption that the Russians may some day develop a supersonic bomber, General?

General PARTRIDGE. Yes.

Mr. HAMILTON. Do we have any estimate, in time, as to when that bomber is likely to be developed?

General PARTRIDGE. I do not.

Mr. HAMILTON. You do not, sir.

Senator SALTONSTALL. Did you say "bomb" or "bomber"?

Mr. HAMILTON. "Bomber," sir.

Now, addressing your attention, General, to the defense facilities and resources that you command at the present time, I wonder if you would give the committee the benefit of your views as to whether those facilities are adequate and satisfactory or not.

UNITED STATES DEFENSE RESOURCES INADEQUATE

General PARTRIDGE. Well, it should be obvious that the facilities and the equipment, resources in general, that we have for air defense at the present time are not completely adequate. This is self-evident, because we are building on the system as rapidly as we can.

We need——

Mr. HAMILTON. May I just interrupt there, sir?

General PARTRIDGE. Yes.

Mr. HAMILTON. Just to make my question clear.

It is conceivable that they might be adequate at the present time, and yet you might feel that they would become inadequate down the road, for the reason that the Russian strength might grow. In other words, it seems to me—I meant to have or to express two possibilities

in the question: One, whether they are now satisfactory from the standpoint of their present strength; and then, coming later on, the point of whether under the plans they would be satisfactory in view of the presumed increase in Russian strength.

General PARTRIDGE. Well, the present defenses, as I have pointed out, are deficient in early warning time. They are deficient in radar coverage and in performance of the present fighter, the F–86, F–89, and F–94. [Deletion by Department of Defense censor.]

Mr. HAMILTON. This is against the comparable Russian offensive force at the present time; is that right, sir?

General PARTRIDGE. Russian offensive force?

Mr. HAMILTON. Offensive force at the present time.

General PARTRIDGE. At the present time, yes.

Mr. HAMILTON. Having in mind, I suppose, that we have to match our defense against their offense.

General PARTRIDGE. Yes.

We have plans to remedy these deficiencies, and we are proceeding with the program which will make it possible for us to work effectively against any hostile which may come into the system, with the characteristics of the weapons which the Russians appear to be developing.

DEFENSE AGAINST ICBM

This is true through the manned bomber, but when we get to the intercontinental ballistic missile, we have a great deal of work to do, and we do not have the air defense system to combat the ICBM [deletion by Department of Defense censor] at the present time.

Mr. HAMILTON. What, in your view, is required with regard to the development of the defense system for the ICBM? Emphasis on research and development at this stage?

General PARTRIDGE. Yes. This is a research and development problem which will eventually require the installation of long-range radars, some new types of radars, and some very fine communications and computors.

Now, it is highly probable that the SAGE system, and the communications setup for SAGE, will make a major contribution in combatting the ICBM.

It is also possible that we will be able to use some of our present ground-to-air missiles, augmented, improved; but this has not yet been determined.

Mr. HAMILTON. How would you judge or evaluate the relative priority of our getting a research and development program for attaining the intercontinental ballistic missile as compared with the research and development program for developing devices (*a*) to detect and (*b*) to destroy the ICBM?

General PARTRIDGE. I am not qualified to say what is being done.

Mr. HAMILTON. No, sir. I appreciate that.

General PARTRIDGE. In my opinion, it is just as important to develop the defenses against the missile as it is to develop the offensive missile itself.

Mr. HAMILTON. And do I correctly state my impression, do I correctly state your views that the two elements in the defense, the two principal elements in the defense against the ICBM are the radar

system, the communications system to detect, and then a countermissile to destroy?

General PARTRIDGE. Correct.

ALTITUDE DEFICIENCY OF UNITED STATES FIGHTERS

Mr. HAMILTON. Now, addressing your attention for the moment to the altitude of our present fighter planes, how does it happen, General, that we don't have a fighter plane which has an altitude sufficient to be as effective as I understand you would like it against the new Russian long-range bombers?

General PARTRIDGE. This deficiency stems back to a lack of research and development in the years long since past, maybe 10 years ago. The engines we use today come from projects which were initiated, say, 7 to 10 years ago.

At that time our budget was extremely small, and we had to make a decision as to whether we were going to work on all five of the engines that had to be developed, or whether we were going to concentrate on one.

I think we made the right decision. We concentrated on the turbojet, and we have some very fine, very reliable turbojets, and we have some bombers and fighters which use those.

Superiority in the air usually depends on the time at which people standardize on equipment. If we have a 1956 model and a 1954 model, it is almost always true that the 1956 model will be superior to the other one.

And we decided to standardize on the turbojet, build some fighters, get some experience, and we are now in the process of bringing along the second family, which will be a very good, a very effective supersonic, high-altitude fighter.

Mr. HAMILTON. What is the thrust of our jet fighter engines, approximately; what is the range?

SOVIET ENGINES SUPERIOR

General PARTRIDGE. Our engines, the engines we are using, I still can't tell you the thrust of them. I can tell you how far they go, how high they go, and that sort of thing, but I can't tell you the thrust.

Mr. HAMILTON. You don't know how their thrust compares with the most powerful Russian jet engine?

General PARTRIDGE. The Russians have jet engines of greater thrust than we do.

Mr. HAMILTON. Are those engines in operation?

General PARTRIDGE. Yes.

Mr. HAMILTON. Would those engines have a greater thrust than the engine in the new 104 fighter, if you know?

General PARTRIDGE. I don't know.

Mr. HAMILTON. Would any member of your staff have that information that would be readily available?

General PARTRIDGE. We can get the information.

Mr. HAMILTON. Yes. I think it might be interesting.

General PARTRIDGE. I have yet to see this engine.

Mr. HAMILTON. Would it be advantageous for us to have an engine with a greater thrust than those that we have in operation and plan to have in operation?

General PARTRIDGE. Yes, it is mandatory that we bring out some new engines which will permit us to fly our fighters at a very much higher speed than is presently possible, and cruise at higher altitude.

Mr. HAMILTON. When you say "presently possible," you include the F–104 in that?

General PARTRIDGE. I include the F–104. [Deletion by Department of Defense censor.]

Mr. HAMILTON. Do you know what, if anything, is being done with research and development to develop an engine of the kind that you think is desirable, sir?

General PARTRIDGE. No, I do not.

Mr. HAMILTON. We will ask the R. and D. on that.

General PARTRIDGE. I am not up to date.

Mr. HAMILTON. How would you list the development of such an engine in terms of priority of R. and D., from the standpoint of defense, I mean within the next 2, 3, or 4 years, sir? Or maybe—let me withdraw that question, and maybe make it easier for you, General, if I just say: Would you mind giving the committee the principal matters that you think, from the standpoint of defense, it would be useful to have developed?

IMPROVED ENGINES SHOULD HAVE HIGH PRIORITY

General PARTRIDGE. Well, I think very high priority should be given to the development of a powerplant for a fighter to get high speed, high altitude, a manned fighter.

This may involve some——

Mr. HAMILTON. What sort of altitudes would you have in mind, performancewise?

General PARTRIDGE. I think we could get one that would go up to 80,000 feet, or perhaps higher than that.

Mr. HAMILTON. Within what period of time do you think it would be desirable to have such a fighter?

General PARTRIDGE. As soon as you can get it—yesterday, if possible.

Mr. HAMILTON. Then what about the speed of the fighter?

General PARTRIDGE. It seems reasonable to assume that we can get speeds up around Mach 3 now, three times the speed of sound.

Mr. HAMILTON. I see.

General PARTRIDGE. But a great deal of research is going to have to be done, not only in the field of the engine itself, but in bringing along an airframe and components to withstand the terrific heat which will be encountered.

Components which operate very well, indeed, with normal temperatures are going to be completely useless in a high-speed aircraft.

This is a situation that is not well known, but suppose you have a tire, just an ordinary rubber tire, for landing purposes, and you withdraw it into the fuselage after takeoff. The fuselage then gets hot, several hundred degrees—just from the heat of passage of air over the fuselage and wings.

Mr. HAMILTON. I see.

General PARTRIDGE. So we are going to have to do research, taking a very simple case, in the case of a rubber tire itself, and so on, through every component of the aircraft. The seals——

Mr. HAMILTON. What, sir?

General PARTRIDGE. The seals—we are using neoprene now for seals in many places where two pipes join together, and so on.

Mr. HAMILTON. Is there any other field for R. & D., aside from propulsion and aside from the detection of the ICBM and the counter-ICBM missile?

NEED IMPROVED FIRE-CONTROL SYSTEMS

General PARTRIDGE. We need to do considerable work—maybe it is a minor item, but it is a big one to me—we need to do considerable work in the matter of improving the reliability of our fire-control systems, and insuring that the ones that come along later are much more adaptable to our purposes than the ones we have now.

PERSONNEL DEFICIENCIES

Mr. HAMILTON. Now turning to the personnel problem that you touched on yesterday. Senator Symington referred to a Readers' Digest story in one of the open hearings, which indicated that the lack of trained personnel was making it difficult, if not impossible, for you to fully utilize the complement of aircraft that you now have.

I wonder if you would describe what, if any, restrictive effect lack of skilled personnel is having upon your utilization of the present defense facilities.

General PARTRIDGE. Well, at the present time we are operating all our aircraft in the Air Defense Command, 25 per squadron. However, we do not get as much training out of these as we would like, simply because we cannot generate the time, the flying hours, as a result—and this arises from the lack of maintenance personnel.

Mr. HAMILTON. Would you have any estimate as to the extent to which that restricts your training, lack of maintenance, lack of properly qualified maintenance personnel?

General PARTRIDGE. I would say maybe 6 hours, 5 hours a month, something of that sort. That is in the order of 25 percent.

Mr. HAMILTON. In the order of 25 percent.

General PARTRIDGE. Yes; we are, fortunately or unfortunately, we are short of crews.

Mr. HAMILTON. Your shortages tend to cancel out.

General PARTRIDGE. The shortages tend to cancel out.

Mr. HAMILTON. Why are you short of crews, General?

General PATRIDGE. We are manned according to a priority set up by the Headquarters, USAF, and we have—we would like to be manned at the ratio of 1.4 or above.

Mr. HAMILTON. Crews per plane?

General PARTRIDGE. Crews per aircraft. We actually are manned 1.2 in the F–86, 1.0 in the F–89, and 0.8 in the F–94's, as of last month.

Mr. HAMILTON. As you get more aircraft, will you get more crews to take care of them?

General PARTRIDGE. We will get the same proportion, no doubt, as we have at the present time, something of the same order.

LACK OF PERSONNEL HAMPERS ALERT STATUS

Mr. HAMILTON. Would that place any limitation, that lack of crews, upon the number of aircraft you can keep alert on the runways at any one time?

General PARTRIDGE. Yes. We would keep more crews on alert if we had more maintenance people, and more pilots. We have actually reduced our defenses somewhat to accommodate these factors.

Mr. HAMILTON. Yes.

Now turning to the question of maintenance, General, what has been your situation there in the last few years with regard to maintenance and operations?

PERSONNEL SHORTAGE AFFECTS MAINTENANCE

General PARTRIDGE. Well, we are about 80 percent manned, effectively manned, and the prospect is that we are going to be less adequately manned in the months that lie ahead, immediately ahead.

Mr. HAMILTON. That is from the standpoint of personnel?

General PARTRIDGE. Yes.

Mr. HAMILTON. Are there any plans or programs now under way to improve that situation, do you know?

General PARTRIDGE. I can't see any immediate improvement. As a matter of fact, there is going to be a retrogression for the next few months.

Mr. HAMILTON. What about, say, down the road a period, 1958–60?

General PARTRIDGE. I can't forecast that far ahead from my place of business.

Mr. HAMILTON. Turning to maintenance and operations, General, that is an item in the budget, as I understand it.

General PARTRIDGE. Yes.

Mr. HAMILTON. I wonder if you would describe what items that covers, what items those funds are spent for, so to speak.

General PARTRIDGE. The maintenance and operations function covers a host of items, the principal ones being the purchase of gasoline and oil, fuel, in other words; maintenance and upkeep of the buildings, facilities, runways, and so on; the hire of certain people, either people or services. These are the big chunks.

Mr. HAMILTON. What kinds of people, sir?

General PARTRIDGE. Maintenance people.

Mr. HAMILTON. To keep your aircraft?

General PARTRIDGE. Yes; technical advisers, and so on.

Mr. HAMILTON. Are your maintenance and operations facilities now adequate?

MAINTENANCE AND OPERATIONS FACILITIES AND FUNDS INADEQUATE

General PARTRIDGE. They are not as adequate as I would like to see them; no.

Mr. HAMILTON. You mentioned some figures to me when we were talking, General.

General PARTRIDGE. Yes.

Mr. HAMILTON. I wonder if you would mind giving the committee the benefit of those figures.

General PARTRIDGE. Perhaps it will give you some feel for the kind of money we are talking about if I say that the maintenance and operations funds for the Air Defense Command for the years 1955, 1956, and 1957——

Mr. HAMILTON. Are those fiscal years, sir?

General PARTRIDGE. Fiscal years [continuing] were as follows: We asked for $176 million in fiscal year 1955, and received $152 million; in fiscal 1956 we asked for $219 million, and received $190 million; in 1957 we asked for $346 million, and we will probably get about $232 million, although we are not certain about that.

Mr. HAMILTON. What will the future trend of your needs be, General?

General PARTRIDGE. Well, the future trend is upward at a very sharp angle, because this covers communications costs, among other things, and in the years which lie ahead, these costs will be very high.

Mr. HAMILTON. Have the funds that you have gotten been adequate, or have they restricted your defensive capacity; would you say?

General PARTRIDGE. Well, the funds have not been adequate, and you see this most concretely when you go out to look at a base .

For example, we are holding off on painting our bases. We are failing to repair the pavements, and so on.

Mr. HAMILTON. Of course, items like that don't really affect your combat effectiveness, do they, General?

General PARTRIDGE. Yes.

Mr. HAMILTON. Whether the shed is painted or not?

General PARTRIDGE. If you have a runway which is coming apart, and you find a lot of stones on it, you have to spend more money for operations, because you have to sweep the runway with a mechanical sweeper every day. Even so, you are liable to pick up stones from the runway, they go in, it is called foreign-object damage, they go into the engine, and we have to change many an engine simply because we are not holding down the damage to the runway in the first place.

Mr. HAMILTON. You mean that is true at the present time?

General PARTRIDGE. Yes.

Mr. HAMILTON. What about the situation with your expanded force down the road?

General PARTRIDGE. Now we are just going to have to have more money for increased maintenance and operation expenditures.

Mr. HAMILTON. Do you have any indication of what the order of the increase would be, over the $346 million that you requested, over fiscal 1957, sir?

General PARTRIDGE. I would estimate it would be at least twice that much.

Mr. HAMILTON. By what time?

General PARTRIDGE. By next year.

Mr. HAMILTON. 1958?

General PARTRIDGE. Yes.

Mr. HAMILTON. Then would it tend to level out, or would it continue to——

General PARTRIDGE. No; it would continue to keep on climbing, sir.

Mr. HAMILTON. And those funds are for repairs, gasoline, technical personnel?

General PARTRIDGE. Yes.

Mr. HAMILTON. Communications systems like the SAGE?

General PARTRIDGE. Yes.

Mr. HAMILTON. Now turning to bases, I gather that when we were talking about bases, we were just talking about the capital cost of the base, General, because you mentioned that the repair of the base came out of maintenance and operation; is that right?

BASE STRUCTURE INADEQUATE

General PARTRIDGE. You are talking about construction?

Mr. HAMILTON. Bases; yes, sir. We were talking about construction funds, which you mentioned yesterday.

General PARTRIDGE. Yes.

Mr. HAMILTON. Are we just talking about the original cost of the base?

General PARTRIDGE. Yes.

Mr. HAMILTON. And the maintenance of the base and keeping the gravel and the cracks out of the runways, and so forth, that comes out of maintenance and operations?

General PARTRIDGE. That is right.

Mr. HAMILTON. What is the situation with respect to your present base structure; is it adequate, in your view?

General PARTRIDGE. It is not entirely adequate; no.

Mr. HAMILTON. In what regards does it miss being adequate?

General PARTRIDGE. Well, we have a considerable number of bases where we have 2 squadrons on a base, and for 1 reason or another we have not been able to move the squadron off the base to its destination.

For example, I have two squadrons down at McGhee-Tyson, down at Knoxville, Tenn. One of those squadrons is supposed to go to Spain, but the base in Spain isn't ready, either, so we have two squadrons in one squadron's facilities at that particular place.

Mr. HAMILTON. What are the particular disadvantages where you have 2 squadrons in 1 squadron's facilities, as you put it?

General PARTRIDGE. Well, we compound our maintenance problems in one way.

Mr. HAMILTON. How is that?

General PARTRIDGE. Simply because you have to work out of doors on the aircraft, and this becomes difficult, leaving off the space. All the facilities are equally crowded.

Mr. HAMILTON. Do you know—what is your judgment as to whether, under present plans and programs, you would have your base structure, down the road 2 or 3 or 4 years, in terms of the force that is planned?

General PARTRIDGE. I can't answer that one. All I can say is, I ask for more money than I get in the construction field. This is a very serious problem.

Mr. HAMILTON. You think it is a serious problem——

General PARTRIDGE. Yes, sir.

Mr. HAMILTON (continuing). From the standpoint of your combat effectiveness?

General PARTRIDGE. Right.

DEPENDENCE UPON CAA

Mr. HAMILTON. One final question, General: You mentioned the other day the importance of the CAA in the identification of planes. I believe the figure you gave us was there were about 30,000 flights a day in United States——

General PARTRIDGE. Yes.

Mr. HAMILTON (continuing). In domestic commerce, and 600 flights a day in interstate and foreign commerce.

General PARTRIDGE. Right.

Mr. HAMILTON. And you said, as I recall it, that you were really virtually dependent upon the CAA.

General PARTRIDGE. That is true.

Mr. HAMILTON. What is the situation with respect to adequacy of the facilities of the CAA to give you the help you need on the identification aspect of defense, if you know?

General PARTRIDGE. Well, it is well known that the CAA's facilities are inadequate for the job which they have to carry out.

Mr. HAMILTON. Look, General, you say it is well known. I am sure it is, but with people who are familiar with it. But I wondered if you could tell us in what respects it is well known.

I don't mean in what respects it is well known, but what are the lacks that CAA has?

General PARTRIDGE. Yes.

The system was built many, many years ago to take care of aircraft going 150 miles an hour. It has been improved by the addition of more communications facilities, a better type of board on which to put this little slot or piece of paper so that it can be read in the control center, and so on.

But we still have the same difficulty in the CAA that we have in the Air Force; we have a manually operated traffic control system. It is mandatory that the CAA go to a much more automatic arrangement, involving radar and automatic data transmission.

Mr. HAMILTON. Comparable to your SAGE system?

General PARTRIDGE. Comparable to the SAGE system.

It is possible, and studies on this are being carried out now, it is possible that we could impose upon the SAGE system a portion of the load of the CAA. In other words, we might be able to use the SAGE radar, the radar which have imputs into SAGE computers; we might use the communications incident to SAGE to help the CAA solve their problem.

I have talked to Mr. Lowen about this. As you know, General Curtis is also studying the problem.

I believe there is hope that we could get a real return on it in civil life for civil aviation, out of our SAGE system.

Mr. HAMILTON. Any other respects in which the CAA suffers under handicaps?

General PARTRIDGE. I am sure they will say they are short of money, too.

Mr. HAMILTON. Thank you, Mr. Chairman. That is all I have at this time.

Senator SYMINGTON. Senator Saltonstall?

Senator SALTONSTALL. General, it has been very interesting hearing you, and you have been very clear in what you have said.

Let me ask you just a few questions.

PRIORITY OF NEEDS

First, what order of priority would you give, on the following matters, and perhaps, if there are any others, add to them: Operation and maintenance; research; bases; planes; and housing. Are there any other items that you wish to add to that?

General PARTRIDGE. People.

Senator SALTONSTALL. People, generally, I will put in operations and maintenance. Pilots, you say—where would you differentiate them from people in operations and maintenance?

General PARTRIDGE. People come first, and they don't go technically in the budget. They don't go into the M. and O. funds, maintenance and operations funds. That is a separate package, one for civilians and another package for the military.

I believe that the care of our people, their training, their retention in the service, is our No. 1 problem.

Second in order of immediacy, this construction business gives me most trouble. This is a frustrating business, as far as I am concerned. If there were any way to simplify it to expedite it, it would be most helpful.

R. and D. research and development is a long-range effort. We are using now the equipment for which we provided funds in the R. and D. field in 1944–47. It is a long-range proposition; and as we go ahead in other fields, say in construction, we must also go ahead in R. and D.

Unfortunately, from the point of view of dollars, effort, we are going out in all directions in R. and D., and you hardly know what road to follow, what paths to follow of the very large number of paths that are open to the R. and D. men.

I know, because I used to command the Research and Development Command. You are always in an argument or discussions as to whether you should go on this line of approach or that one or the other one, and the funds required are getting larger by the year.

Senator SALTONSTALL. Then you did not mention heavier production of planes. Would you put that in at the end of those others?

General PARTRIDGE. In my case, the production of planes—you are speaking now of numbers of planes—takes on an aspect of lesser importance than the others. My immediate and most pressing problem is to bring the establishment which is already in being, or programed, up to the peak effectiveness, and get it set so we will be prepared to ward off an attack, should it be started.

Senator SALTONSTALL. Of those, you put people first, bases second, and maintenance and operations third; is that correct.

General PARTRIDGE. That is about right. R. and D., and finally, additional numbers of aircraft.

IMPROVEMENT NEEDED IN RESEARCH AND DEVELOPMENT

Senator SALTONSTALL. Are you satisfied with the quality of the research effort, as far as it goes?

General PARTRIDGE. As far as it goes, yes.

Senator SALTONSTALL. Are you satisfied with the way that it is being coordinated today and administered, as far as you know?

General PARTRIDGE. No, I wouldn't say I am very happy about that.

Senator SALTONSTALL. What would you do if you were in complete charge?

General PARTRIDGE. I really don't know. I would work, to the best of my ability, to reduce the amount of time it takes to get a decision.

If we could make up our mind along what paths we want to proceed, this business of fanning out again, do we want to go that way or this way, all going to the same objective, you understand, if we could get the machinery streamlined in some way so that we could get a decision, I believe this is the line of approach I would take.

Senator SALTONSTALL. One more question. You mentioned the CAA.

General PARTRIDGE. Yes, sir.

CAA AND COMPLEXITY OF PROBLEM

Senator SALTONSTALL. I have listened to that discussion for a number of years. Theirs is a problem and a question of a difference of ideas and a contest between different ideas as to the equipment, what equipment the CAA should have, and then it is a question of dollars, on how much we should extend its operation and into what fields.

Is that a fair statement of the problem?

General PARTRIDGE. Senator, I believe you are confusing the requirement for omnirange equipment, omni and DME, distance measuring equipment, with the basic problem.

Without being critical of the CAA, I don't believe they appreciate the complexity of the problem, nor are they taking the proper approach to its solution.

I say this with some misgivings, because I do not know as much about their problem as they do.

But we do every day what they must do. We take a fighter off the ground here, we fly it into the atmosphere and make it come to a certain point in space, and bring it back home again; and they are going to have to do this same function with civil air traffic eventually.

I do not believe it can be solved in the method in which they are proceeding.

Senator SALTONSTALL. Well, just one final question on that: From your observation, and perhaps it is about the same as mine, there is a difference of opinion, perhaps, between the civilian groups as to how they should proceed, and there is also a difference of opinion between the military and civilian groups as to what are the wisest and first steps for the CAA to proceed along.

General PARTRIDGE. Yes, there is a definite difference of opinion, and it is my understanding that General Curtis has been appointed to find out some means of resolving the problem.

Senator SALTONSTALL. Thank you, Mr. Chairman.

I appreciate General Partridge's being here, and what he told us.

Senator SYMINGTON. Senator Duff?

SHORTAGE OF SKILLED PERSONNEL

Senator DUFF. General, I understand that one of your great difficulties is keeping a sufficient number of fully competent technicians?

General PARTRIDGE. That is correct.

Senator DUFF. And isn't part of that problem due to the fact that in the enlisted service, about the time a man really becomes efficient, that is about the time he leaves and goes into private enterprise?

General PARTRIDGE. That is correct.

Senator DUFF. And does that not, therefore, bring it down to the proposition, for a solution, that you are going to have to get around to having a large civilian personnel that will remain permanently with you, instead of leaving you at about the time they can render the best service?

General PARTRIDGE. The problem can be attacked in that manner with very good results in my command, the Air Defense Command. You cannot go completely to that solution, because we have other Air Force requirements which depend on the resources of the Air Defense Command.

In other words, I must have people in Air Defense Command in stations in the United States from which we can draw to send people to air defenses in Germany or Thule.

Senator DUFF. Yes, sir.

General PARTRIDGE. Or other places.

Senator DUFF. Yes, sir; I understand that phase of it; but I meant for filling up the vacuum that exists in the present situation, the civilian, permanent civilian employees would be one of the answers; would it not?

General PARTRIDGE. Yes, sir; it would be very helpful.

LEAD TIME

Senator DUFF. What is the time lag, General, between the engineering and experimentation with a new type of plane and the time when that plane could be operational?

General PARTRIDGE. Well, the various components don't come along in any one period of time. The airframe developments take 3 to 5 years; the powerplant developments 5 to 7 or 8 years; and the fire-control system, strangely enough, takes 7 years or maybe 10 years, something of that sort, from the time you get a conception of the requirement until you get the hardware to fly on the field.

Senator DUFF. So that there has to be very definitely an allowance for a long time lag in order to meet the challenges that we face?

General PARTRIDGE. That is correct.

(Deletion by Department of Defense censor.)

Senator SYMINGTON. Senator Welker, we had a briefing yesterday, and if you will indulge me, I would like to ask a few questions which might generate some on your part, also.

Senator WELKER. Thank you. I am enjoying the hearing, Mr. Chairman. I don't want to intrude upon the time of my colleagues.

Senator SYMINGTON. No, indeed. We look forward, as soon as I have had a chance to ask questions, we would appreciate your asking questions.

ALTITUDE DEFICIENCY OF UNITED STATES FIGHTERS

In your testimony yesterday, General Partridge, you said, and this follows some of the questions that Senator Duff has just asked—you said:

We now have a good system to fight the TU–4. Unfortunately, the Russians came along a little more rapidly than we had anticipated in their technical developments, and they introduced a jet bomber and the Bear more rapidly than was forecast. As a result, we find ourselves in the years 1957, 1958, and early 1959 in not too good shape with regard to our high-altitude and our low-altitude air defense.

We are trying to cover the gap in the low altitude with a ground observer corps. We are anxious to bring in the F–102 to help with the high-altitude coverage.

Is it a fair statement to say that what you mean by that is that we have an air defense system capable of handling the B–29 type, TU–4, but that we have been, in effect, caught short by the awareness in the last year or two of development in the Russian bombers?

General PARTRIDGE. Well, we have known about the Badger, the Bison, and the Bear for a considerable period; just how long, I cannot say offhand.

The Badger we saw first, but it was not until the air show of 1955 that the Russians began to show these larger bombers in numbers. Their rehearsals for the air show in Moscow in May of 1955 really introduced this note of urgency in getting along with the defenses against that type of aircraft. We didn't think they could bring them into production as quickly as they did.

ONE-WAY MISSIONS

Senator SYMINGTON. In the past war, we did not kill any prisoners, did we. It was not our policy to murder prisoners, was it?

General PARTRIDGE. It was against the policy to treat them other than as prescribed by the rules of war.

Senator SYMINGTON. Do you know of any violations of that, of any major character?

General PARTRIDGE. No.

Senator SYMINGTON. Now, when you have a chance to destroy a city if you can get a bomber through, and inasmuch as the crew would feel fairly safe from being tortured or murdered, would it not be your belief that they would be willing to risk one-way flights and a sudden atomic attack if at the same time they could destroy a city if a bomber came through?

General PARTRIDGE. I think they would, yes.

UNITED STATES DEFENSE CAPABILITIES INADEQUATE

(Deletion by Department of Defense censor)

Senator SYMINGTON. Based on the information you have given to this committee, we do not have planes with sufficient capabilities to provide the defense you, as the commander of the Air Defense Command, believe is needed. Is that correct?

General PARTRIDGE. I am not satisfied with what we have at this time.

We are taking two steps at the present time to improve the situation from our point of view:

IMPROVEMENTS UNDERWAY

The first of these is the introduction of the Falcon missile, the first aircraft are now being equipped, and I hope this month we will have some F–89H aircraft equipped with [deletion by Department of Defense censor] Falcons, which will add to our defense capability at high altitude.

(Deletion by Department of Defense censor.)

Now, the second step we are taking is to bring in the F–102A. The first unit is now being formed, and by the end of this year I hope there will be a number of operational aircraft.

(Deletion by Department of Defense censor.)

FALCONS

Senator SYMINGTON. Now, assume that you placed on them Falcons, air-to-air missiles, what would be the maximum altitude that these present airplanes that you have would be effective?

General PARTRIDGE. I can't say, because I haven't the latest figures.

(Deletion by Department of Defense censor.)

We are just now getting the aircraft into the inventory, and we haven't had a chance to practice with them.

Senator SYMINGTON. But what you would like to say is there is a chance you could hit that high [deletion by Department of Defense censor] with the Falcon?

General PARTRIDGE. Well, we might. But what I would say is that we try to use our tactics or distribution to counteract this type of attack. A man cannot stay up there very long. It is uncomfortable for him, and very expensive.

(Deletion by Department of Defense censor.)

F–102's

Senator SYMINGTON. Turning now to the second part of your answer, the F–102's, is your command the only command that is going to get F–102's?

General PARTRIDGE. The only command in the United States; yes, sir.

Senator SYMINGTON. In the United States.

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. What command outside of the United States will get them?

General PARTRIDGE. I don't know. I am sure some will go overseas, however.

(Deletion by Department of Defense censor.) The bulk of those will come to the Air Defense Command.

Senator SYMINGTON. And the sooner you get those, the better for the defense of the United States; is that correct?

General PARTRIDGE. Quite correct.

Senator SYMINGTON. Now turning again to your testimony of yesterday, you said:

The aircraft presently in the inventory are subsonic or of insufficient altitude performance.

That is what you have today. Is that what we have been talking about?

General PARTRIDGE. Yes, sir.

UNRELIABILITY OF FIRE-CONTROL SYSTEM

Senator SYMINGTON. And you continue:

Even in our present-day aircraft, the unreliability of our fire-control equipment downgrades our capability to achieve full operational effectiveness.

Why is that fire-control equipment unreliable, in your opinion?

General PARTRIDGE. Well, the answer is complex, again; as complex as the fire-control system, almost.

The equipment we are using has never been built for any other nation, so far as we know. We are pioneering in the, what is called the lead collision course type of attack, in which we fly at 90 degrees to the target and release our rockets on signal from the computer in the aircraft.

Since it is new equipment, and since we haven't had it in service too long, there have been bugs in it, as there are in all new equipments. However, if you take the best technicians we can find, the people who build it, and provide us with skilled technicians, Hughes, if we take those to the range with us and we test each individual box, put it back in the airplane, even then we are not sure we are going to get a hit, because the balance between the various boxes may be upset electronically in some way.

So we go up and fire, the pilot says he makes a perfect run, the equipment shows he makes a perfect run, but we still don't get a hit on that particular run. We still don't know why. We are studying the problem.

More research is required to insure that we have a system, a plan, an arrangement for testing the entire system after it is in the airplane.

Senator SYMINGTON. In other words, as I understand it, you have a problem of the necessity for high-class mechanics and electronic experts?

General PARTRIDGE. Right.

Senator SYMINGTON. And the more complete the training of those men, the better your fire-control equipment will be; is that correct?

General PARTRIDGE. Yes.

Perhaps I can give you one set of figures that will outline or highlight the importance of the electronics man in our present-day squadron.

When I commanded a squadron at Selfridge Field many years ago, we had 132 men in the squadron altogether. In the present 102 squadron which is coming along, there are 430 people, including the officers. Half of those people are essentially electronics people of one sort or another. Over a hundred of them work in the fire-control side of the picture.

So the problem is far different than it used to be, even in World War II. We just are going way off in the direction of electronics.

LACK OF TRAINED PERSONNEL

Senator SYMINGTON. Then you support completely General LeMay's problem?

General PARTRIDGE. I do, indeed; yes.

Senator SYMINGTON. The lack, shortage, of adequate technical people is a very serious problem to your command, also?

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. You heard the testimony of General LeMay. Is your problem about the same as his, from the standpoint of personnel?

General PARTRIDGE. I did not listen to his presentation here, but I have heard it before, and I do agree with it.

Senator SYMINGTON. Have you read this article in the Reader's Digest?

General PARTRIDGE. No, sir. I just heard of that this morning.

Senator SYMINGTON. You have not read that?

Proceeding with your testimony yesterday, the question came up of the limitations created by the statute incident to civilians as against military. We were to be supplied that information.

Is anybody here prepared, from the Department of Defense, to give us that information now?

General PARTRIDGE. I don't think that answer is ready yet.

Senator SYMINGTON. Nobody has that information yet, is that it?

INSUFFICIENT FUNDS FOR CONSTRUCTION

You testified this morning that the problem of construction was one of your most serious problems——

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. Is that right?

And from the figures you gave, you are getting less instead of more of what you asked for; is that correct?

General PARTRIDGE. Percentagewise, that is correct; yes.

Senator SYMINGTON. I am talking percentagewise.

For example, you say that in 1956 you asked for $421 million and got $344 million; and in 1957 you asked for $504 million—no; in 1955 you asked for $509 million and got $268 million; is that right?

I wish you would look at this record when you get it, and clear us up here.

General PARTRIDGE. If I recall correctly, we asked for $509 million in 1957.

Senator SYMINGTON. It is almost impossible to——

Mr. HAMILTON. $504 million, I think, General, you said in 1957, and you got $268 million.

General PARTRIDGE. It would appear we would get $268 million.

Senator SYMINGTON. Yes, sir. Will you just check the record to be sure?

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. You feel this is a very serious matter.

General PARTRIDGE. Yes; it is, because at the present time we are at the stage where we must put up the money to prepare installations to receive Talos, and later [deletion by Department of Defense censor] we must be prepared to take on the Bomarc. We just have to get construction funds for these purposes; and these are in addition to the base structure which we must provide.

Senator SYMINGTON. Did you, yourself, supervise the final compilation of this request before it was forwarded to headquarters?

General PARTRIDGE. I reviewed them; yes.

Senator SYMINGTON. You did. Was there any padding in them? Did you feel that it would be a good idea to pad them because they would probably be cut anyway, or did you put down what you thought was right?

General PARTRIDGE. No; we followed the second system. We put down what we think we have to have, because I will explain to you why we do this: There are a lot of other things we would like to have, too, and we whittle those off to the end that we may get as operational as we possibly can, with the first part of our military construction program.

OBSOLESCENT FIGHTERS

Senator SYMINGTON. [Deletion by Department of Defense censor.] When discussing the chart, you mentioned your fighters. You said they are F–84's, F–89's, and F–94's; is that correct?

General PARTRIDGE. 86's.

Senator SYMINGTON. 84's, 89's, and 86's?

General PARTRIDGE. No, sir; 86's, 89's, and 94's.

Senator SYMINGTON. I beg your pardon. SAC has the 84's.

Based on the information you have given us, as against the new production of Soviet bombers, is it a fair statement to say that all those fighters that you now have are obsolescent?

General PARTRIDGE. They are obsolescent, but some of them will still be in the inventory in 1959.

Senator SYMINGTON. So by that time, if things progress as they have been progressing, they will then be obsolete, won't they, so far as effective interception is concerned?

General PARTRIDGE. They will be 3 years older, but still could be useful.

(Deletion by Department of Defense censor.)

Senator SYMINGTON. You say new fighters are coming into the inventory, new missiles against the Russian Badger, the Bison, and the Bear, as well as the Bull; and when that happens, that you will be in much better shape.

General PARTRIDGE. True.

Senator SYMINGTON. Is that correct?

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. When do you expect to replace your 86's, 89's, and 94's with modern transsonic or supersonic fighters?

General PARTRIDGE. Gradually, between now and the next few years, as new aircraft become available.

(Deletion by Department of Defense censor.)

Senator SYMINGTON. You also mentioned the fact that you were going to get some F–100's.

General PARTRIDGE. No, sir. No, sir; they are in the Tactical Air Command. If we get any, it will be a temporary arrangement.

CREW SHORTAGE

Senator SYMINGTON. I see. The F–100 story came in at one point, and I did not quite understand that. Now you say you are short of crews.

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. Is that right?

General PARTRIDGE. Yes, sir.

Senator SYMINGTON. What is the result of being short of crews?

General PARTRIDGE. You either overwork the ones you have, or you degrade your defenses a little bit to have lesser numbers of them immediately available.

Senator SYMINGTON. I went out to see an alert at one of your commands, and it went off badly. Some of the officers felt one of the reasons was they did not have the equipment or the base structure. Would there be practical cases like that which would justify your comments this morning?

General PARTRIDGE. I didn't hear of this particular incident.

Senator SYMINGTON. What is the nature of alert?

General PARTRIDGE. We are supposed to have 2 aircraft on 5-minute alert.

Senator SYMINGTON. Yes.

General PARTRIDGE. And they are supposed to be able to take off within 3 minutes, or they usually do.

Senator SYMINGTON. Well, this didn't operate that way. What I am trying to say is, Do you believe the lack of what you have given us here can only ultimately result in lack of maximum efficiency, or effectiveness, in your command?

General PARTRIDGE. Yes. All of these factors will eventually, if they do not already, affect the combat operational status of the command.

Senator SYMINGTON. You talk about order of priority, and you were close to General Arnold. He once said that the second-best Air Force is worth exactly as much as the second-best poker hand. I always liked that expression.

DECREASING DOLLAR EMPHASIS ON DEFENSE

As far as this priority business is concerned, for some years now we have not only spent less in percentage of our gross national product on defense, but less in dollars and cents, even though we have had a steadily increasing gross national product.

Do you think, as we look at the problem of defense and see the rise of Russian airpower, submarine power, and so forth, that we ought to put a priority on these various essentials of the component parts incident to overall national airpower?

General PARTRIDGE. Yes.

Senator SYMINGTON. You were the commanding officer in Korea when that war started, in the previous administration; were you not?

General PARTRIDGE. That is right.

SHORTAGES WHEN KOREAN WAR STARTED

Senator SYMINGTON. Did you suffer heavily because many of the budget items requested were not allowed, at the beginning of the war?

General PARTRIDGE. Well, I don't think I ever thought in terms of budget items. We were handicapped by the fact that we had just reduced our Air Force, and I had just reduced the Fifth Air Force from some 18,000 or 20,000 people backed up by about 40,000 Japanese, down to some 12,000.

And when we moved to Korea, of course, we had to leave our Japanese back in Japan itself; so when we did move we were—we had wonderful units, they were well equipped, but the numbers were meager, to say the least.

Senator SYMINGTON. You were short of planes; were you not?

General PARTRIDGE. Well, we were short of the kind of a plane that we needed. Unfortunately, we had—the attack, I believe, was intentionally timed so that they expected, the North Koreans expected, to take advantage of the fact that our F–80's, with which we had been recently reequipped, would not go the full distance to the battleline.

A little Yankee ingenuity had remedied that to a large extent, but we still couldn't operate these aircraft in numbers in Korea because there weren't airfields over there for them, so we had to convert again back to a conventional aircraft; and in the process, of course, lost a great deal of effectiveness.

Senator SYMINGTON. How about crews? Did you have enough crews?

General PARTRIDGE. We had crews, because we soon had them brought over from the United States. We had no trouble there.

Senator SYMINGTON. How about maintenance and operations?

General PARTRIDGE. No trouble there, either, because they stripped the rest of the Air Force to provide us with the necessary resources.

Senator SYMINGTON. So what were your chief shortages at the start, for maximum effectiveness at the start of the Korean trouble?

General PARTRIDGE. What was our chief limitation?

Senator SYMINGTON. Yes.

NEEDED MORE PLANES, MORE PERSONNEL

General PARTRIDGE. Numbers, principally; just sheer numbers of things and people. We were never, never short of maintenance. We were never short of armament. We were never short of fuel.

We ran very close many times in both those fields; but we just didn't have enough sorties available to provide the kind of assistance that we could have given to the Eighth Army had we had more resources.

Senator SYMINGTON. More planes?

General PARTRIDGE. More planes, more people.

Senator SYMINGTON. More people.

Thank you, General.

Senator Welker?

Senator WELKER. It is very kind of you.

General Partridge, I am delighted to be permitted to ask you a couple of questions. I am some sort of a pseudo-airman, and my fellow colleagues, Senators Saltonstall, Duff, and Symington, have been very kind to me.

ENGINES

Senator WELKER. Would you be good enough to tell me, General, what is the difference between a turbojet engine and a jet engine?

General PARTRIDGE. Perhaps you mean turboprop engine and a jet engine.

Senator WELKER. Well, I understand the Defense Department set up an identification of aircraft roles and missions system, and they used the words "turbojet engine." Does that mean a jet engine?

General PARTRIDGE. It always has in any document I have ever seen. In other words, a turbojet and a jet are the same.

A turboprop is a gas turbine, swinging a propeller.

Senator WELKER. I understand that. Thank you very much.

Now, is it a fact that we are manufacturing in England today many of our turboprop engines and many of our turbojet engines, and in Holland?

General PARTRIDGE. We are manufacturing for the United States Air Force?

Senator WELKER. Yes.

General PARTRIDGE. I couldn't say. There may be some purchases over there with which I am not familiar, but as far as my command is concerned, all the engines that I use are built in the United States.

Senator WELKER. Very well.

Those are under English license, some from Rolls Royce?

General PARTRIDGE. Yes. The Capital Airliner that flies in the United States uses a turboprop. Probably you are familiar with that type of aircraft.

Senator WELKER. I have flown in it; and also, I know Fairchild is going to do it with their 127.

General PARTRIDGE. It is built in England.

Senator WELKER. General, I have had one of the great airmen of our Nation, who has been chief pilot of one of our airlines, as my houseguest over the weekend, and he informed me that in Western Europe the radar screens were not even turning.

Now, he is a man not prone to mislead you or me or especially the country. But with the giant installations such as the commercial airfields, military airfields, in England and Belgium and Holland and in France, would you tell me why something so very, very necessary for your command and survival of the western free world would be sitting there idle?

LACK OF COORDINATED DEFENSE IN EUROPE

General PARTRIDGE. Well, there isn't any coordinated, integrated air defense system in Europe.

Senator WELKER. What was that again?

General PARTRIDGE. The British——

Senator WELKER. There isn't any what?

General PARTRIDGE. There isn't any coordinated or integrated air defense system in Europe as a whole, Western Europe.

Plans for providing such a system are being pushed by General Gruenther personally.

Senator WELKER. With all due respect to my friend, General Gruenther, don't you think he is a little bit late on that?

General PARTRIDGE. He has been unable to convince the various countries that they should join in the production of this system, in the establishment of this system.

Perhaps I can give you a little background which will explain why I know this is so.

In October of last year, I was asked to go to Europe to talk to the Defense Ministers on the subject of air defense. I was asked to go because they do not have in Europe a coordinated air defense system.

I talked to them a long time to explain what a system involves and why they should have one.

Then General Gruenther, at his own headquarters, took, I guess, at least a half-hour of his precious time to explain to them that they just had to build an air defense system for Western Europe.

More recently, I have learned that plans for the establishment of a net of radar from Norway all the way around through Italy to Turkey is being drawn, and that the various countries have agreed to this, in general.

Their difficulty is that they refuse to let other nations operate across their borders.

Senator WELKER. The French have not agreed to it, have they?

General PARTRIDGE. I don't know whether they have agreed to it completely, or not.

Senator WELKER. The thing that struck me has to do with the defense installations—and I think you will admit that the radar screen is a very important thing——

General PARTRIDGE. Yes.

Senator WELKER (continuing) so far as air defense is concerned. Certainly it is needed around Rolls Royce in Holland and other places, on which actually we must rely for their strength. I was interested to note that Khrushchev and Bulganin, when they were in England with three Badgers, had no secret to hide at all; they landed at the airport in London. My airman friend was very much impressed that the Badger looked even better to him, as an airman, than even our B–47. They took three of them over there. They were first criticized because of taking one over, according to the English press, as some one said they only had one, so they sent back and got two more, just for show.

OBSOLETE FIGHTERS

General, like all of us here on this committee, I am concerned about where this is all going to end. I know that it is a necessary thing for us to have the best poker hand, but at the same time I am concerned about this idea of our fighter aircraft, and I believe you have testified, as most airmen will testify of their being more or less obsolete [Deletion by Department of Defense censor]. Is that a fair assumption?

General PARTRIDGE. It is a fair assumption at the moment. [Deletion by Department of Defense censor].

Senator WELKER. You mean until we get the Century series in?

NO F–102'S NOW

General PARTRIDGE. Yes.

Senator WELKER. And you have how many F–102's?

General PARTRIDGE. Zero. Now?

Senator WELKER. Yes. You have how many F–102B's?

General PARTRIDGE. We don't have any—we do not have any at the present time. [Deletion by Department of Defense censor.]

NO F–104'S NOW

Senator WELKER. How many F–104's do we have?

General PARTRIDGE. There aren't any.

Senator WELKER. You know, General, as just an old cowboy from Idaho, it seems to me to be a terrible way to run a Defense Establishment. I am going to be quite frank with you. I know very well it has been hard to get this wonderful stuff.

I have made the statement several times before my colleagues that I do not want to be the richest man in the cemetery. If those Soviets mean business—I am convinced they are not building that airpower just to look at—I certainly would do a crash job to get you people to do your job well.

PRODUCTION OF PLANES IN WORLD WAR II

I don't suppose you want to be quoted on anything I have to say about a crash job on this thing. As I told the committee, one time when I was practicing law in Los Angeles, the reason why I went into the Air Force, I heard the statement made by our President, President Roosevelt, that we would have 50,000 airplanes. I thought he was crazy, but we did get 50,000 airplanes; and some of them, I think, are still in your inventory now. You probably have some B–26's yet, haven't you?

General PARTRIDGE. Yes; a few.

Senator WELKER. Where do you use those?

General PARTRIDGE. The ones that we have in the Air Defense Command are used for tow-target purposes, ECM, that sort of thing. There are very few of them.

OUR FIGHTERS VERSUS THE BISON

Senator WELKER. [Deletion by Department of Defense censor.] Then my concluding question is this: On the basis of the altitude deficiency previously referred to, our present fighter aircraft are going to have trouble in shooting down that Bison, aren't they, because of the lack of maneuverability at high altitude?

General PARTRIDGE. It will be difficult; yes.

Senator WELKER. Difficult, if not impossible.

I think you told Senator Duff you would shallow-bank.

General PARTRIDGE. Yes.

Senator WELKER. An aircraft with a shallow bank wouldn't be able to do much with a Bison.

General PARTRIDGE. That makes it more difficult, but the positioning is done by the man on the ground. The man on the ground controls the fighter and tells when to turn and where, and he takes into account the fact that the fighter doesn't turn very quickly. But the final approach on the attack is made in a straight line, and the fire-control equipment takes into account the speed of the bomber.

Senator WELKER. [Deletion by Department of Defense censor.] If we can't reach them, we must depend on our Falcon, did you say?

General PARTRIDGE. Yes.

Senator WELKER. Have we made any tests of that yet?

General PARTRIDGE. Yes. They have made tests, but not in my command; and just what results they can expect to get on a day-in and day-out basis, I can't tell you.

Senator WELKER. I thank you, Mr. Chairman, and you, Senator Saltonstall and Senator Duff, and you, counsel, and especially you, General Partridge, whom I have admired for many years as being one of our great airmen of all times.

Thank you very much, sir.

Senator SYMINGTON. Thank you, Senator.

Mr. Counsel, have you any further questions you would like to ask? We will stop at a quarter to one.

Mr. HAMILTON. I am not certain we can conclude; I hope to leave some time for members of the committee.

DEFENSE VERSUS OFFENSE

General, in connection with your discussion of the fire-control system, you mentioned how complicated a device it was compared with those that you had to contend with in World War II, and that reminded me of your testimony yesterday in which you described in a general way the extent to which our defensive resources had, so to speak, increased since World War II.

Would you care to comment, for the benefit of the committee, upon what relationship there has been in the growth and effectiveness of our defensive weapons and resources on the one hand, and the growth and the effectiveness since World War II of offensive weapons and resources?

General PARTRIDGE. Well, I don't think I could handle that one——

Mr. HAMILTON. Maybe I can make it clearer.

General PARTRIDGE. And give you any reasonable answer. It is quite obvious that we have gone from high explosives in World War II to the atomic weapon, and from the atomic weapon to the thermonuclear weapon.

One airplane wtih a thermonuclear weapon can readily destroy one city.

Mr. HAMILTON. You made clear the weakness in my question. I will reframe it to make it more specific and helpful to you. I can state it this way:

In World War II the defensive forces were able to shoot down a given proportion of the attacking planes.

General PARTRIDGE. Yes, sir.

Mr. HAMILTON. Now, disregarding weapons, would you say that the effectiveness of defense from the standpoint of its capacity to shoot down attacking bombers is relatively greater than it was in World War II, or relatively about the same, or relatively less?

General PARTRIDGE. Oh, the ability to shoot down bombers is very much greater now than it ever was before.

Mr. HAMILTON. Even taking into account improvements in bombers?

General PARTRIDGE. Yes. Discounting the fact we can't get altitude to hit all of them at the moment, still the capacity is infinitely greater than it was in World War II.

Mr. HAMILTON. So, then, would it be fair to conclude that the improvements in the technology, so to speak, of the defensive force have made it relatively more effective against an attacking force, even though the attacking force likewise has improved technologically?

General PARTRIDGE. Yes; I think that would be a fair statement.

Mr. HAMILTON. Do you have any illustrations of any exercises that you performed against an attacking force—I have the impression that you do run exercises of that kind with SAC making the attack and your command defending?

General PARTGIDGE. Yes; we do run exercises.

Mr. HAMILTON. What has been your experience in that regard?

General PARTRIDGE. Well, I have only been around while we ran one. I can give you a short rundown on that, if you would like.

Mr. HAMILTON. I think it might be interesting.

TEST EXERCISES AGAINST ATTACK

General PARTRIDGE. In general, it is almost impossible for the Strategic Air Command to carry out a realistic test of the system; and as we build further to the North and put the sea flanks on it is going to be impossible, I believe.

Mr. HAMILTON. You mean to really get a true test?

General PARTRIDGE. To get a true test.

For example, just to take some of the homely things that you have to contend with, the CAA must give Strategic Air Command permission to operate without lights. This takes weeks, just in the making sure that everybody who is in the area on a particular night knows that there are going to be many aircraft in there at certain altitudes without lights.

The use of ECM; electronic countermeasures, if the Strategic Air Command were to come into this country with their ECM equipment operational——

Mr. HAMILTON. ECM is electronic countermeasures?

General PARTRIDGE (continuing). Electronic countermeasures operational, they might jam up some of the equipment being used for air-traffic control or navigational purposes, and we would lose a civil airliner, or something of that sort.

So it gets almost impossible for them to make a realistic attack against us.

Mr. HAMILTON. Yes.

General PARTRIDGE. But we did run one exercise, and I will mention it, although the final analysis of the thing has not been concluded yet.

SAC made an attack on us using 263 bombers, and they came in in waves, two waves on a night, unannounced. We were able to do reasonably well against them, and I will tell you exactly how much.

We did our best against the waves that came in across Canada. Two waves came in across Canada, with another wave coming in from the west coast.

Mr. HAMILTON. How many aircraft were there in each attacking wave, General?

General PARTRIDGE. There were, I have forgotten how they were broken down, but 263 of them were in there, altogether [deletion by Department of Defense censor].

We made quite a few attacks, or identification runs, at least, on aircraft, on other aircraft flying around the atmosphere, because another reason we have difficulty in having a realistic test is, we can't get the civil aircraft out of the air.

This degrades our air defense system by a considerable amount, but we don't know how much.

Similarly, we should shut off all aids to navigation. We have a plan for doing this in wartime. We can't do it now.

We brought quite a few of these incoming aircraft under fire, simulated fire, under aircraft or Nikes [deletion by Department of Defense censor], and all in all, according to General LeMay's personal statement, he thought we were several times as effective this time in getting to the bombers before they reached the bomb release line as we were in a previous exercise which he had conducted.

This was my first exercise, and I have no personal knowledge of other ones.

We demonstrated the same things I have been talking to you about here. We are weak at high altitude. We are weak at low altitude, and so on.

We have a pretty good detection capability [deletion by Department of Defense censor]. Even today, we see practically all the bombers that come into the system; and we would see a great many more of them, probably practically every one, if we could get rid of the civil aircraft that clutter up the scopes.

Mr. HAMILTON. Do you have anything on destruction? You talked about identification and interception.

General PARTRIDGE. No.

Mr. HAMILTON. It is pretty difficult to tell?

General PARTRIDGE. Yes. It is pretty difficult, and it has not been finally decided about how many would be shot down.

Mr. HAMILTON. How many aborts did you have, General, on that mission?

General PARTRIDGE. How many aborts? I don't know.

One thing we did get, Colonel Scott advises me here, is that we did get out of the ground observer corps in Canada some 5 hours of warning. I mentioned this before. But this is the exercise on which we got the 5 hours' warning.

The exercise was supposed to be run without any knowledge on our part of what was going to take place.

Mr. HAMILTON. You mean when it was, or anything like that?

General PARTRIDGE. Yes.

Mr. HAMILTON. Secondly, do you have any—what kind of aircraft did SAC use in that attack?

General PARTRIDGE. They used all kinds, B–36's, and B–47's, and B–52's.

Mr. HAMILTON. They have a small number of B–52's.

General PARTRIDGE. Yes.

NUCLEAR PLANES

Mr. HAMILTON. Do you know whether or not the Russians are working on a nuclear plane, or whether we are planning defenses against a nuclear plane or chemically fueled plane, General?

General PARTRIDGE. No, I do not. I assume they are, or should be.

SOVIETS SKILLED IN COUNTERMEASURES

Mr. HAMILTON. Do you know what effective countermeasures the Russians may have in the way of jamming, and things of that kind, that would put an additional burden on your defense forces?

General PARTRIDGE. No, but I could get a man to give you a very good briefing on that subject if you wanted to listen to it.

Mr. HAMILTON. Who would that be?

General PARTRIDGE. A man from headquarters. But I suggest you not listen, and take just this general statement on the subject:

After the war, we published in a large set of volumes, about that long, the United States' experience in radar and electronic countermeasures, and so on.

Mr. HAMILTON. Countermeasures, too, did we?

General PARTRIDGE. Yes.

Mr. HAMILTON. Jamming, and all that?

General PARTRIDGE. Yes. The Russians have reproduced this set.

In addition to that, they have been jamming radio for years. This is one of their major operations, so I am sure——

Mr. HAMILTON. Major operations?

General PARTRIDGE. Yes, the jamming of the Voice of America is one of the major efforts of the Soviets.

So I am sure you will find that they have people who are highly skilled technically in jamming equipment and in handling, devising, using jamming equipment.

Just what effect it would have on us or what effect it would have on the Strategic Air Command, I cannot say.

DEVELOPMENT OF UNITED STATES COUNTERMEASURES

Mr. HAMILTON. Are we working on counter-countermeasures, if that is the right phrase?

General PARTRIDGE. Yes, certainly.

Mr. HAMILTON. Is that work in the production stage, or development or research stage?

General PARTRIDGE. It is in all stages.

Mr. HAMILTON. It is in all stages?

General PARTRIDGE. It is a continuing battle of wits to get ahead of the other fellow's wizards. It is a battle of the wizards, actually.

FUNDS NEEDED FOR EFFECTIVE DEFENSE

Mr. HAMILTON. General, you may not care to answer this question, but I thought I would ask it, in any event.

Would you care to give the committee any indication as to the magnitude or amount of money that is involved in taking the various measures that you have given the committee as your opinion that should be taken now, and down the road, to give us an adequate defense or a satisfactory defense?

General PARTRIDGE. I can give you an indication of the magnitude of the money required to implement the program which we have laid out for the continental United States, nothing outside.

Mr. HAMILTON. What would that run?

General PARTRIDGE. For the years from 1951 to 1965, a total of 15 years, the capital outlay will run about $24 billion, and the operating costs another 36 or 37, for a total for the 15 years of about $60 billion. Very little of this has been spent already.

Mr. HAMILTON. Sir?

General PARTRIDGE. Very little of this has been spent already. The big expenditures still lie ahead of us.

Mr. HAMILTON. You say that is limited to the United States.

Will there be expenditures required outside the territorial limits of the United States?

General PARTRIDGE. Correct.

Mr. HAMILTON. What would be the nature of those expenditures, General? I am not talking about the size. I am just talking about the character.

General PARTRIDGE. The character?

Mr. HAMILTON. Yes.

General PARTRIDGE. The distant early warning line.

Senator SYMINGTON. I am sorry, but I think we will have to ask you to come back this afternoon at 2 o'clock.

I want to ask several more questions, myself, and I am sure some of the other committee members might want to, also.

Mr. HAMILTON. I have virtually concluded.

Senator SYMINGTON. I am sure we can be through with you this afternoon.

If it is in order, I would like to have the committee staff stay here with the committee for a few minutes.

I promised Senator Saltonstall I would stop at a quarter of 1. We will see you at 2 o'clock.

(Whereupon, at 12:45 p. m., the subcommittee recessed, to reconvene at 2 p. m., of the same day.)

AFTERNOON SESSION

Present: Senators Symington (presiding), Jackson, Saltonstall, and Duff.

Also present: Fowler Hamilton, general counsel; Ramsay D. Potts, Jr., associate general counsel; Fred B. Rhodes legal consultant to Senator Saltonstall; Wallace Engle, staff member; Edward C. Welsh, assistant to Senator Symington.

Brig. Gen. Frank E. Rouse, Headquarters USAF; Gen. Curtis E. LeMay, commander in chief, SAC; Maj. Gen. John P. McConnell, director of plans, SAC; Col. J. F. Kirkendall, aide to General Partridge; Col. Cecil Scott, aide to general Partridge; Lt. Col. D. C. Jones, USAF; Mansfield Sprague, General Counsel, Department of Defense; Lt. Col. Donald S. Bussey, ODCS, Operations, Department of Army; Capt. S. S. Searcy, Jr., United States Navy, assistant director, progress analysis group, Chief of Naval Operations.

Senator SYMINGTON. General Partridge, we will call the hearing to order.

I think that counsel was in the process of asking you some questions.

STATEMENT OF GEN. EARLE E. PARTRIDGE, COMMANDER IN CHIEF, AIR DEFENSE COMMAND AND CONTINENTAL AIR DEFENSE COMMAND, USAF—Resumed

Senator SYMINGTON. Mr. Counsel, will you proceed?

Mr. HAMILTON. Yes, sir. Thank you Mr. Chairman.

General, the $61 billion figure that you gave us as an item of cost, did that relate only to your own command?

SIXTY-ONE BILLION DOLLARS

General PARTRIDGE. That relates solely to the Air Defense Command and for a period of 15 years according to the present program.

Mr. HAMILTON. 15 years from?

General PARTRIDGE. 1951 to 1965. It does not include the Navy's participation nor the Army's participation.

Neither does it include anything outside of the United States.

Mr. HAMILTON. What would be the kinds of expenditures that would be involved outside the United States?

I asked that question as we adjourned.

General PARTRIDGE. Yes.

Mr. HAMILTON. I was not sure that your answer had been concluded.

You had mentioned DEW line.

General PARTRIDGE. Expense for the distant early warning line that stretches from Alaska to Baffin Island, expenses for the Navy's participation in extending two lines [deletion by Department of Defense censor] for example.

Mr. HAMILTON. Would those be extensions by picket ship or by aircraft or by Texas towers?

General PARTRIDGE. They are extensions by picket ship and airborne early warning aircraft.

Then if there are systems devised for the intercontinental ballistic missile, those must be added also.

Mr. HAMILTON. This would not include any research and development, or would it?

General PARTRIDGE. No, it includes nothing except direct capital costs and operating costs.

(Deletion by Department of Defense censor.)

WARNING SYSTEM INCOMPLETE

Mr. HAMILTON. I was not quite clear, General, as to whether the extension of the radar warning system was to be effectuated by the use of Constellation aircraft, whether it had been put into operation yet or whether that was still under consideration.

General PARTRIDGE. It is programed but it is not yet in operation insofar as the Navy's portion of the barriers is concerned.

The Air Defense Command operates Lockheed Constellations adjacent to the United States. These are already working.

Mr. HAMILTON. The 61 billion, then I take it, in addition to the capital item that you mentioned, would include such matters as your annual expenses for personnel, M. and O., procurement?

General PARTRIDGE. Gasoline and oil, weapons, and aircraft.

Mr. HAMILTON. Thank you very much, sir. No more questions.

Senator SYMINGTON. Senator Saltonstall?

Senator SALTONSTALL. I have no further question, Mr. Chairman, thank you.

Senator SYMINGTON. Senator Duff?

Senator DUFF. No further questions, sir.

Senator SYMINGTON. Senator Jackson, have you any questions that you would like to ask?

Senator JACKSON. Mr. Chairman, I am sorry that I missed some of the session yesterday afternoon.

General, do you have any specific recommendations—if this question is repetitious please tell me—any recommendations to make with reference to the possibility of our speeding up any of these programs that are essential to your command?

AUTHORITY FOR SOLUTION TO DIFFICULTIES

General PARTRIDGE. No; I have no specific recommendations. I merely indicated areas in which I am having troubles, and they are not soluble. I can't reach a solution within my own resources. These are Air Force and Department of Defense troubles and will have to be attacked on that basis.

For example, I have suggested that we might civilianize to some extent. It is not within my capability to do this at the present time. If I could, I would already be doing it.

Senator JACKSON. Was that matter resolved as to the limitation, Mr. Chairman?

Senator SYMINGTON. I would rather have you ask counsel that.

Mr. HAMILTON. We have not received the information yet, but I understand it is going to be obtained and furnished by the defense establishment as to whether it stems from legislation or administrative aspects.

Senator SYMINGTON. Yes; we asked this morning.

I did not hear the question; I am sorry.

Senator JACKSON. Otherwise you are satisfied with the dollar program—it is not a matter of dollar shortage right now as far as your command is concerned?

NOT SATISFIED WITH PROGRAM

General PARTRIDGE. I would not say that I am at all satisfied with what is going on. I do not think the defenses are good enough. I wish they were better, and if I had more adequate resources, I could make them better right now; for example, if I could be manned 100 percent with skilled people, I could produce a defense which right now is a lot better than the one I am able to keep in being.

Senator JACKSON. You have a personnel problem somewhat along the lines that General LeMay outlined to us, maybe not identical but it involves some of the same basic difficulties?

General PARTRIDGE. I have the same basic troubles that General LeMay has in SAC.

Senator JACKSON. What about interceptors and equipment?

General PARTRIDGE. Interceptors, the ones I have now I have pointed out are subsonic aircraft with an operating altitude which is below that which I would like to see [Deletion by Department of Defense censor.]

ANTIMISSILE MISSILE

Senator JACKSON. General, is it accurate to say that for the first time we are trying to anticipate a new offensive weapons system by going after the defensive weapon before the offensive weapon comes into being?

I am referring now to the so-called anti-ICBM missile.

Isn't this about the first time that has ever happened?

General PARTRIDGE. No; I would not say this is the first time. We think in terms of the coming threat and we only get caught a little short when we underestimate the enemy's capability to bring along technical improvements.

Senator JACKSON. Well, I mean the result has been, at least in the last few years, that we have been lagging behind on defensive capability of the enemy in interceptors that could deal with them?

General PARTRIDGE. This could be true, but we are bringing along interceptors as rapidly as we can with the technological advances that are being made, and as new and better weapons come along, we will incorporate them into the inventory and in whatever numbers we can get them.

Senator JACKSON. That is all, Mr. Chairman.

Senator SYMINGTON. General, I just have one thought about some of your testimony this morning.

ALTITUDES OF WORLD WAR II AIRCRAFT

During World War II, the major fighter planes, the Spitfire, the Hurricane, P–47, P–51, what was their altitude, do you know roughly?

General PARTRIDGE. No; I do not.

The Spitfire, for example, would fly between 30 and 35,000 feet and if it was properly equipped, they could fly the distance on photographic reconnaissance missions up around 40, a little over 40.

Our own Mustang would fly reasonably well up to 32 to 35,000 feet and when it was light they could be pushed up higher than that.

Senator SYMINGTON. Were they both higher than the 47 or the Hurricane?

General PARTRIDGE. Yes.

Senator SYMINGTON. What was the altitude of the B–17's and the B–24's?

General PARTRIDGE. Depending on how they were loaded——

Senator SYMINGTON. What did you consider the top ceiling that you could handle in combat approach?

General PARTRIDGE. We could operate the B–24's and B–17's up around 28,000 or 30,000 feet, but if you loaded them down the way we wanted to to go to Germany, the best operating altitudes were say 21,000 for the B–24 and 25,000 to 27,000 for the B–17, 25,000 say.

RELATIVE ALTITUDE CAPABILITIES CHANGED SINCE WORLD WAR II

Senator SYMINGTON. So that in World War II, the operational altitude of your fighters was considerably higher than your bombers; is that a fair statement?

General PARTRIDGE. Yes.

Senator SYMINGTON. And based on your testimony this morning, the operational altitude of the enemy bombers is considerably higher than the fighters that you have; is that right?

General PARTRIDGE. Well, that is the extreme statement of it.

I would say that a few enemy bombers presently can operate higher than our fighters if they come in under certain conditions one way, light bomb load and so on.

Senator SYMINGTON. I am only asking for information.

I am only trying to follow your testimony.

[Deletion by Department of Defense censor.]

Thank you, General.

Mr. Counsel, have you any further questions?

Senator Saltonstall?

Senator Jackson?

Senator Duff?

APPRECIATION FOR BRIEFING

We thank you very much, General, for a magnificent briefing and for your kindness in answering questions.

SUBCOMMITTEE PROCEDURE

We are very sorry, Mr. Sprague, about the problem that we have today. Of course it was accentuated by the death of Senator Barkley.

At first we thought that you did not want to have a hearing today; Mr. Hamilton told me that, and then later said that you felt we could have one today with General LeMay. The secretary of the majority had announced, as you may have seen in the paper, that there would probably be no hearings today, although it would be left up to the discretion of the committee chairmen. I took it up with the Secretary of the Senate and told him what you told Mr. Hamilton, that General LeMay was anxious to get back to his command.

Mr. Johnson, the Secretary of the Senate said, under the circumstances he felt it would be all right for us to go ahead this afternoon, even though I do not think there is any other committee of the Congress meeting this afternoon at least in open session. We made our plans accordingly, but we did not have the questions or answers by a quarter after one. The press yesterday seemed very appreciative of the fact that the questions and answers had been mimeographed. Hence, the committee decided at the hearing just before we adjourned that we would like to have General LeMay back on the following day, when such procedure could again be followed.

Obviously we would not want the hearings at the same time as the services for Senator Barkley. We waited until we found out when they would be. We now understand they will be at 11 o'clock. Many of us would like to be there, so it is our suggestion General LeMay come back after the services, at say 2 o'clock.

Could the Chair ask you, Mr. Sprague, when we will have the LeMay questions and answers?

Mr. SPRAGUE. Don't you have them?

Senator SYMINGTON. No.

Mr. SPRAGUE. I have not got them. I gave instructions to the Air Force to send them up.

Senator SYMINGTON. Have you seen them, counsel?

Mr. HAMILTON. No, I checked about 1:10 or 1:20 with the various offices. We will check again.

Mr. SPRAGUE. Instructions were given to the best of my knowledge about 12:20 to send them up.

Senator SYMINGTON. At a quarter after one we did not have them.

Mr. HAMILTON. I called about 1:30.

Senator SYMINGTON. We did not leave this room until a quarter after. I know this is inconvenient to some people but, inasmuch as we have lost one of our great men, I hope all will put up with it. It is a sad day for the country.

Mr. SPRAGUE. One thing that you perhaps could do: The original questions that were sent over were given to General LeMay yesterday afternoon.

The Air Force themselves decided that some of them could not be given in public session. They therefore divided the questions into two groups and answered those which would have to be given in closed session on one set of papers and those that could be given in open session on a second set of papers.

General LeMay does have with him the answers to the questions which can be answered in executive session, and if you want to get that over with now——

Senator SYMINGTON. Well, it would not take very long, the questions and answers tomorrow. I see that the Air Force has just arrived with it.

Under the circumstances I would suggest that we wait until tomorrow.

Does that meet with your approval?

Mr. SPRAGUE. It is all right with me, sir.

Senator SYMINGTON. We will adjourn at this time.

(Whereupon, at 2:30 p. m., the committee was adjourned.)

STUDY OF AIRPOWER

FRIDAY, MAY 25, 1956

UNITED STATES SENATE,
SUBCOMMITTEE ON THE AIR FORCE
OF THE COMMITTEE ON ARMED SERVICES,
Washington, D. C.

The subcommittee (consisting of Senators Symington, Jackson, Ervin, Saltonstall, and Duff) met, pursuant to recess, at 10 a. m., in room P–63, United States Capitol, Senator Stuart Symington (chairman of the subcommittee) presiding.

Present: Senators Symington (presiding) and Saltonstall.

Also present: Fowler Hamilton, general counsel; Ramsay D. Potts, Jr., associate general counsel; Fred B. Rhodes, legal consultant to Senator Saltonstall; Edward C. Welsh, assistant to Senator Symington; Wallace L. Engle, staff member.

Senator SYMINGTON. This meeting of the Subcommittee on the Air Force of the Committee on Armed Services will please come to order.

The purpose of our meeting this morning is to hear testimony from Gen. Earle Partridge, commanding general of the Air Defense Command and Continental Air Defense Command.

General Partridge is in charge of the defense of our country against an atomic air attack. His testimony will be given under a procedure similar to that followed in the testimony of Gen. Curtis LeMay, commanding general of the Strategic Air Command. Certain questions that will be put to General Partridge and the answers that he will give to them have been reviewed in the Pentagon from the security standpoint.

I should like now to point out, however, that General Partridge himself is responsible for the information and opinions which he will give to the committee.

General Partridge's testimony is part, and an important part, of the third phase of these hearings. During this phase the committee is obtaining the best available information concerning the strength of our country's airpower.

This phase of our inquiry is covering our present airpower position and our prospective airpower position in the 1958–60 period, with respect both to manned aircraft and missiles, from the smallest missile to the intercontinental ballistic missile. We are studying the airpower of the Air Force and the airpower of the Army and the airpower of the Navy.

In the executive hearings, in which for security reasons it is necessary in the first instance to take testimony on these subjects, we have heard more than 45 witnesses from the three services.

The testimony that these witnesses have given us amounts approximately to 2,000 pages, and this phase of the hearing is not yet concluded.

The testimony obtained in closed sessions will be made public, except for such portions as are deleted for security reasons, as soon as it can be given security review and is printed.

In addition, we will from time to time have open hearings, similar to the one this morning, on certain specific and important aspects of our airpower situation, such as the vital subject of our present and prospective defenses against nuclear air attack upon our country.

General Partridge, are you the only one who plans to testify this morning?

General PARTRIDGE. Yes, sir; that is true.

Senator SYMINGTON. Will you consider yourself sworn?

General PARTRIDGE. I do.

Senator SYMINGTON. Your testimony therefore will be taken under oath.

Before General Partridge is questioned by counsel and the committee, I would like to read a summary of his record.

GEN. EARLE E. PARTRIDGE

Earle Everard Partridge was born at Winchendon, Mass., on July 7, 1900. He enlisted in the Army July 10, 1918, at Fort Slocum, N. Y., and was assigned to the Fifth Engineer Training Regiment at Camp Humphries, Va.

General Partridge went to France in August 1918, and served in the Argonne offensive with the 79th Division. When the division returned to Camp Dix, N. J., in June 1919 he was honorably discharged.

Following a year at Norwich University, General Partridge reenlisted in June 1920. A year later he was appointed to the United States Military Academy, was graduated June 12, 1924, and commissioned a second lieutenant of Air Service in the Regular Army. Entering primary flying school at Brooks Field, Tex., he was graduated from advanced flying school, Kelly Field, Tex. After serving 10 months in the 3d Attack Group there, he was appointed an instructor at the advanced flying school there in July 1926. He became an instructor in mathematics at the Military Academy in September 1929.

Going to the Panama Canal Zone in October 1930, he was assigned to the 7th Observation Squadron at France Field, and was later transferred to the 6th Composite Group there.

In December 1932 General Partridge was assigned to Selfridge Field, Mich., and in July 1936 went to Wright Field, Ohio, as a test pilot. Entering the Air Corps Tactical School at Maxwell Field, Ala., in September of that year, he was graduated the following June and was assigned to the Command and General Staff School at Fort Leavenworth, Kans.

He then returned to Maxwell Field as an instructor in the pursuit section of the Tactical School. Transferring to the Southeast Air Corps training command in June 1940, he took a major part in establishing flying schools in the Southeast. On October 1, 1940, he was sent to Barksdale Field at Shreveport, La., to start an advanced single-engine flying school. He went to Dothan, Ala., in May 1941 to supervise construction of the single-engine advanced flying school there.

Five months later he was assigned to Air Force headquarters as a member of the Air War Plans Division, and in March 1942 was made a member of the War Department General Staff to serve on the Joint Strategic Committee, Joint Chiefs of Staff. He assumed command of the New York Air Defense Wing in January 1943.

The following spring he joined the Northwest African Air Force as operations officer and chief of staff of the 12th Bomber Command and later became chief of staff and deputy commander of the 15th Air Force.

In January 1944 General Partridge moved to England and became deputy commander of the 8th Air Force, and the following June assumed command of the 3rd Bombardment Division. At the close of hostilities in the European Theater General Partridge became deputy commander, and later assumed com-

mand, of the 8th Air Force and assisted in its reorganization and movement to Okinawa in August 1945.

Returning to Air Force headquarters in January 1946, he became Assistant Chief of Staff for Operations. In October of the following year he was appointed Director of Training and Requirements in the office of the Deputy Chief of Staff, Operations, there. Assigned to the 5th Air Force at Nagoya, Japan, in August 1948, he assumed command the following October and took the 5th to Korea in December 1950.

General Partridge was named acting commanding general of the Air Research and Development Command at Wright-Patterson Air Force Base, Ohio, in June 1950, and on July 28, 1951, was designated commanding general of that command, which had moved to Baltimore, Md. He became Deputy Chief of Staff, Operations, at Air Force headquarters, on June 30, 1953.

On April 1, 1954, General Partridge assumed command of the Far East Air Forces at Tokyo, Japan. He was designated Commander in Chief, Continental Air Defense Command, and Commander of the Air Defense Command at Ent AFB, Colo., on July 20, 1955.

His decorations include the Distinguished Service Medal, Legion of Merit, Distinguished Flying Cross, Bronze Star Medal, and the Air Medal with three Oak Leaf Clusters.

For his service in the Korean campaign he was also awarded the Distinguished Service Cross, Silver Star, two Oak Leaf Clusters to the Distinguished Flying Cross, and seven Oak Leaf Clusters to the Air Medal.

His foreign decorations include the French Legion of Honor and Croix de Guerre with two Palms; the Polish Order of Polonia Restituta, Chevalier, with Commander's Cross with Star; British Order of the British Empire (Honorary Knight Commander) and Companion of the Order of the Bath; and the Belgian Crox de Guerre with Palm.

He won the distinguished Aerial Gunner's Medal in 1926 and 1928. He is rated a command pilot, combat observer, and aircraft observer.

General Partridge, I knew you had an excellent record, but it is, in fact, even more impressive than I had realized.

Senator SALTONSTALL. Mr. Chairman, may I say I am glad General Partridge was born in Massachusetts.

Senator SYMINGTON. General, no man could come before us today with more facts based on experience than you can as a result of that record. I know that the distinguished Senator from Massachusetts is delighted that you came from his State and we are all glad you are an American.

We are pleased to hear from you this morning, General.

Mr. Counsel, will you proceed to question the witness?

TESTIMONY OF GEN. EARLE E. PARTRIDGE, COMMANDER IN CHIEF OF THE CONTINENTAL AIR DEFENSE COMMAND

Mr. HAMILTON. Thank you, Mr. Chairman.

General Partridge, will you please describe for the subcommittee the two principal positions which you now hold.

General PARTRIDGE. At the present time I am the Commander in Chief of the Continental Air Defense Command and also the head of the Air Force portion of that organization, the United States Air Forces Air Defense Command.

Mr. HAMILTON. What is the mission and what are the responsibilities of the Continental Air Defense Command, and where does the Air Defense Command fit into the Continental Air Defense Command?

General PARTRIDGE. The mission of the Continental Air Defense Command as officially stated in my Terms of Reference is to "defend the continental United States against air attack."

In carrying out this mission I exercise operational control over all forces assigned or otherwise made available by the Joint Chiefs of Staff, or other proper authority, for the air defense of the continental United States.

As for the place of the Air Defense Command in the Continental Air Defense organization, I might say that the Continental Air Defense Command is a joint organization responsible to the Joint Chiefs of Staff. There are three service components—Army, Navy, and Air Force—under the Continental Air Defense Command, and the Air Defense Command is the Air Force portion of the overall organization.

I might add that in some respects CONAD is an unusual organization. In unified commands, such as are found in the Far East, it is customary for the overall commander to operate his forces through the component commanders by issuing his orders to them and having them, in turn, pass the instructions to their subordinate units.

The air defense procedures are so vitally concerned with the time of reaction that in Continental Air Defense operations, the units of the Army, Navy, and Air Force are operated directly by me and my subordinate joint commanders.

In other words, the Army, Navy, and Air Force provide the units for air defense purposes, but the actual control of these units in the air battle is a responsibility which I must carry out as commander-in-chief of the Continental Air Defense Command.

Mr. HAMILTON. What types of bombers do the Soviets now have in operational units capable of attacking this country?

General PARTRIDGE. The Soviets now have in operational units four types of bombers which might conceivably be used to attack this country. These are the Bull, which is comparable to our B–29; the Badger, which is comparable to our B–47; the Bison, which is comparable to our B–52; and the Bear, a long-range turboprop bomber for which we have no counterpart.

Mr. HAMILTON. General, if the Soviets should decide to launch an attack against this country, what kind of an attack do you think it would be?

General PARTRIDGE. In evaluating the Soviet threat we feel that the Soviets, if they attack at all, would launch a very large-scale air attack against this country and that they would do their best to achieve surprise.

Mr. HAMILTON. At the present time what size initial attack could the Soviets launch against this country with their heavy bomber force?

General PARTRIDGE. They could launch an attack employing hundreds of bombers.

Mr. HAMILTON. If unopposed, how many of these hundreds of Soviet bombers would be able to get to their targets in the United States?

General PARTRIDGE. If unopposed, we believe that a large percentage of the bombers launched by the Soviets could reach their targets in the United States.

Mr. HAMILTON. What size and type of initial attack will the Soviets be able to launch against this country by 1959?

General PARTRIDGE. By 1959 the Soviets should be able to launch a much stronger attack than they could currently initiate, and by that

time their attacking bomber force could be made up entirely of jet and turboprop bombers.

Mr. HAMILTON. What type and kinds of weapons do we estimate the Russians would employ if they make an attack on this country?

General PARTRIDGE. If the Russians attack this country it is to be expected that they will use nuclear and probably thermonuclear weapons.

Mr. HAMILTON. What targets do you think the Soviets would attack?

General PARTRIDGE. We believe that the Soviets would attack not only the large metropolitan areas that contain the bulk of our population and industry, but that they would also attack the bases from which we mount our retaliatory strikes.

Mr. HAMILTON. How many such prime targets are there in this country?

General PARTRIDGE. Fifty-five percent of the population of the country and about 75 percent of its industry are concentrated in 170 metropolitan areas. I believe these areas, plus the Strategic Air Command's bases and the Atomic Energy Commission's facilities, would be considered prime targets by the Russians.

Mr. HAMILTON. If the Russians successfully attacked the 50 most important metropolitan area targets in the complex you have described, how much of our population and industry would such an attack bring under fire?

General PARTRIDGE. About 40 percent of the population and about 60 percent of the industry of the country.

Mr. HAMILTON. Turning to another subject, would you please describe for the committee the functions of our air defense system?

General PARTRIDGE. The functions of the air defense system are to detect all airborne objects approaching the defended area; identify the object as friendly or hostile; intercept the object if identified as hostile or if identification as friendly is not possible; and to destroy the airborne object if found hostile.

Mr. HAMILTON. Before examining these functions in detail, will you give the subcommittee your view as to the defensive value of our offensive air forces?

General PARTRIDGE. In aerial warfare, as in many other activities, the best defense is usually a good offense. I believe that Strategic Air Command serves not only as a deterrent to enemy attack but that, if a war should occur, Strategic Air Command's retaliatory strikes would be a major factor in reducing the damage which this country might suffer by reason of the enemy's bombing attacks against us.

Mr. HAMILTON. What equipment do we now have to accomplish the first function of our air defense system which you described (i. e., the function of detection)?

General PARTRIDGE. To carry out the detection function, we depend primarily on radar. This may be land-based, on ships at sea, or on aircraft in the air. The radar system is not only nationwide but also extends into contiguous land and water areas. Furthermore, the radar detection system is being expanded rapidly.

Mr. HAMILTON. Is it not true that our present far-warning radar is deficient in its altitude coverage?

General PARTRIDGE. Our present radar coverage is not as effective at altitude as we would like to have it.

Mr. HAMILTON. Isn't it a fact that present programs provide for a considerable increase in the altitude coverage of our radar?

General PARTRIDGE. Our effectiveness at altitude is being increased by the improvement program for present radar and by the addition of new types of radar.

Senator SYMINGTON. The Chair would like to interject a question there.

The question just asked, as I understand it, came to the committee from Senator Saltonstall's office. I did not have a chance to read it. We only got it yesterday afternoon.

When did you get it, General?

General PARTRIDGE. Yesterday afternoon.

Senator SYMINGTON. Inasmuch as I did not have a chance to look at the question, I would like to ask this question. You can answer it or not as you see fit.

When will that program be completed?

Senator SALTONSTALL. Mr. Chairman, I object to this procedure. We are either going to go through with the agreed procedure or each member of the committee is going to have an opportunity to ask questions.

I most respectfully object to this procedure. It was decided in executive session that Mr. Hamilton would have the opportunity to ask questions, and the general would go over them. And we would have the same opportunity. The general is here testifying under oath. If his answers are not the proper ones, he is responsible.

If he received these questions yesterday afternoon, he had plenty of time certainly in which to answer them or to say that he did not want to answer them.

Now, I object most strenuously to any procedure to change that procedure that we have agreed to.

If it is going to be changed, then I respectfully request an executive session and we will go over the whole procedure again.

Senator SYMINGTON. I think there is great merit in the Senator's position. I thought that the counsel to the committee was acting as counsel for the full committee. It was my understanding that you yourself did not see these questions until yesterday.

Apparently, therefore, they were drawn up by your office. I believe that inasmuch as some of these questions which you say that you have not read until today——

Senator SALTONSTALL. Oh, I read them yesterday.

Senator SYMINGTON. I beg your pardon.

Senator SALTONSTALL. I said that I saw them yesterday. I approved the questions and I did not draft the questions.

I did draft one question.

Senator SYMINGTON. I will accede to your wishes. The Chair will in this matter accede. However, General Partridge, inasmuch as these new questions only came yesterday afternoon and inasmuch as I have reservations regarding some of them, I would say at this time that the Chair reserves the right to submit to the full subcommittee the question as to whether we should call General Partridge back for another open hearing.

Senator SALTONSTALL. That is entirely proper, providing, of course, that we each have an opportunity to ask him questions at that time if he so sees fit.

Senator SYMINGTON. That is all right, and each time that a question comes up which is one of the questions that was not gone over by the committee staff or the chairman or the committee counsel since yesterday afternoon, I shall so note.

Senator SALTONSTALL. Then, Mr. Chairman, I reserve the right to note any question as we go along.

Senator SYMINGTON. You have that right.

Senator SALTONSTALL. I again say that I think this is a change in procedure. I understood that General Partridge was going to give his answers to these questions which were prepared. I agree that your questions, the questions of Mr. Hamilton, were submitted yesterday. I did not have the opportunity to go over them. There were certain questions suggested by our staff which I went over with Senator Duff, and we agreed to insert them. And Senator Duff and I each added cooperatively two further questions.

Senator SYMINGTON. General Partridge, if it is in order, would you let the committee know when you received the first questions, the original questions from the committee counsel?

General PARTRIDGE. On Tuesday of this week.

Senator SYMINGTON. On Tuesday of this week?

General PARTRIDGE. Yes.

Senator SYMINGTON. So you have had those questions for 3 days?

General PARTRIDGE. Yes.

Senator SYMINGTON. And you have gone over those questions with the committee counsel in preparation for this hearing?

General PARTRIDGE. I have gone over the questions with the members of my own staff, on the staff of headquarters, not necessarily with the committee, only in fragmentary form.

Senator SYMINGTON. So that group of questions you received Tuesday, and when did you say you received the second group of questions—yesterday?

General PARTRIDGE. Yesterday, I would say soon after noon, the early part of the afternoon.

Senator SYMINGTON. Let the record show counsel says Senator Saltonstall's office did not get our questions until Wednesday morning.

Will you proceed, General?

Senator SALTONSTALL. Let me just add this.

General, the answers to the questions of the counsel and the answers to the very few questions—I think there are only 6 or 8 that we added—are your own answers?

General PARTRIDGE. Yes; they are.

Senator SALTONSTALL. Prepared by yourself?

General PARTRIDGE. Yes.

Senator SYMINGTON. Let me get this straight, Senator Saltonstall.

You object to my noting the questions that were added to the list yesterday?

Senator SALTONSTALL. I think it is fairer, Mr. Chairman; we agreed under the procedure that the counsel should ask questions and that, if there were any questions to be added by Senator Duff and myself, that we would add them.

As I understand it from Mr. Rhodes, who assists us, these questions were sent over to the Pentagon yesterday shortly after noon, around noontime. There were only about 6 or 8. I have no objection if you

want to add each time that those are questions prepared by, or approved by, Senator Duff and myself. I have no objection to that.

Senator SYMINGTON. The way we will proceed is this: We will go through with the hearing today without any further discussion of this question of supplementary questions submitted yesterday, and then we will take it up in executive session with the committee.

Senator SALTONSTALL. That is entirely satisfactory.

Senator SYMINGTON. Will you proceed, General?

Mr. HAMILTON. General, are there at present other limitations on our ability to detect enemy aircraft?

General PARTRIDGE. It is essential that we get as early warning of the approach of a hostile bomber force as we can. At the present time our radar system does not extend far enough out from our borders and steps are being taken to correct this deficiency. In cooperation with the Canadian Government warning lines are being built across the middle and northern part of Canada.

Mr. HAMILTON. Isn't it a fact that the Air Force is now proceeding with a program which will make it possible to work effectively against any Russian aircraft?

General PARTRIDGE. This question is so broad in its scope that it is almost impossible to give a meaningful answer.

If the Air Force's air defense program is fully met it is proceeding toward a capability to meet the estimated enemy manned aircraft threat. It is hoped that research and development programs will provide a basis for meeting the intercontinental missile threat.

Mr. HAMILTON. Will you sum up for the subcommittee what you think needs to be done to improve our capability to detect enemy aircraft?

General PARTRIDGE. As I have just explained, we need to extend our radar coverage outward from the borders of the country, and this is being done. Furthermore, we need to improve both our high-altitude and our low-altitude radar coverage, and programs to this end are being implemented.

Mr. HAMILTON. General, isn't it a fact that the present program will give the country a better air defense system every year? How does it compare today with the World War II air-defense system?

General PARTRIDGE. The air-defense system in the United States is improving steadily year by year and is incomparably better than anything that existed during World War II. However, we should not forget that the power of the offensive striking force is also increasing by leaps and bounds. So we should measure our air-defense system against the current and projected threat rather than against the World War II defense system.

Mr. HAMILTON. Then when will the presently programed warning and detection system be completed?

General PARTRIDGE. It is difficult to give an exact answer to this question because various phases of the warning and detection system come into operation progressively. We still have several years' work ahead of us to complete those portions of the system which are presently programed.

Mr. HAMILTON. What equipment do we now have to accomplish the second function of air defense you have described—that is to say, the identification of enemy aircraft and missiles.

General PARTRIDGE. Once it has been determined that some object is flying in the airspace we want to control, it is necessary that we identify that object and in carrying out this function we work very closely with the Civil Aeronautics Administration.

There are about 30,000 aircraft flights a day over the United States and about 600 more which come in from overseas every 25 hours. Obviously it would be impossible for us to keep track of all of these flights, so we have established air defense identification zones and procedures for matching the flight plans passed to us by the Civil Aeronautics Administration with the actual plots of aircraft as shown on our radar.

By this means we reduce to a very small number the total of significant tracks detected in the system, and we use manned fighters to look over aircraft whose tracks are significant and whose identity is questionable.

Our coordination with the Civil Aeronautics Administration is extremely close and it is our mutual hope that we may find some means by which we can utilize our extensive air defense detection and identification systems to facilitate the movement of air traffic in the jet age.

Mr. HAMILTON. Is it not true that our Air Defense Command has a much greater problem in identifying enemy aircraft than the Soviet air defense command would have?

General PARTRIDGE. I am not sufficiently familiar with the air defense command of the Soviet Union to answer this question. However, I might say that in the event of an emergency in the United States, one of our first steps would be to eliminate all nonessential air traffic.

The capability of our air defense system to identify aircraft tracks there afterwould be tremendously enhanced.

Mr. HAMILTON. General, what equipment do we now have to accomplish the third function of air defense you have described—that is to say, the interception function?

General PARTRIDGE. As I have noted, when an unknown aircraft is discovered to be in the system, we send off a fighter to make an interception and to identify the aircraft visually. This goes on day in and day out on a routine basis.

Mr. HAMILTON. What types of interceptor aircraft do you have in your air defense forces?

General PARTRIDGE. In the Air Defense Command today we have three types of fighter interceptors. These are the F–86D, which we have in largest numbers, the F–94C, and the F–89.

Mr. HAMILTON. General, is it not a fact that the present interceptor planes, upon which our Air Defense Command would have to rely to meet an attack by Russian Bison bombers, have insufficient performance in altitude and speed to cope with such an attack?

General PARTRIDGE. The fighter interceptors which I have mentioned—that is, the F–86, F–89, and F–94, have inadequate altitude performance to cope with the Bison, provided the Soviets should decide to sacrifice their aircraft by employing one-way tactics. However, the introduction of new aircraft and weapons is remedying this deficiency both in speed and altitude.

Mr. HAMILTON. Is there any deficiency in altitude performance of our fighters due to failure to spend enough on research and development in the period prior to 1950?

General PARTRIDGE. Prior to 1950, the budgets on which the Army Air Forces and the Air Force were required to operate were quite small, and during that period it was not possible to support the engine-development program by exploring all the means by which better engines could be secured.

In retrospect, it now appears that it would have been desirable to have concentrated more effort toward the development of high-thrust engines which would give us a greater altitude capability today.

Mr. HAMILTON. Has the use of air-to-air missiles increased the interceptor capability of our present fighters at high altitude?

General PARTRIDGE. I assume that this question has to do with the introduction of the Falcon or other type of guided air-to-air missile. These weapons are being brought into the inventory at the present time and will have a marked influence in increasing our interceptor capability at high altitude.

Mr. HAMILTON. Isn't it a fact that you have ground-to-air missiles in operational units today designed to intercept any Russian aircraft and will have even better missiles coming into operational air defense units during the next few years?

General PARTRIDGE. We already have the first version of the Nike missile on station and improved models will be brought into operational use as soon as possible. These are, however, only deployed at a limited number of locations. When Talos and Bomarc come into our operational inventory, the capacity of the entire air defense system will be still further improved.

Mr. HAMILTON. If the Soviets considered they could obtain greater operational effectiveness by flying one-way flights and then ditching the airplane, of having the crew bail out and be interned, do you think they would use such tactics?

General PARTRIDGE. Yes, I think they would. The Soviets might simply have their crews bail out after attacking the target, expecting them to be interned; or they might have the attacking bomber return to an offshore prearranged rendezvous point where they could be picked up by submarine.

Mr. HAMILTON. Are you now in process of introducing any new fighters into operational units of the Air Defense Command?

General PARTRIDGE. We are putting into operational units the F–102. This is a supersonic, all-weather fighter that operates better at high altitudes than can present fighters.

Mr. HAMILTON. Does the F–102 have adequate combat ceiling to cope with the Bison?

General PARTRIDGE. We expect that the F–102 with its weapons will give us vastly improved capability to intercept modern bombers such as the Bison, at high altitudes. Naturally we would like to have even more altitude performance in our interceptor fighters than we have in the F–102.

Mr. HAMILTON. How many F–102's do we have in the Air Defense Force by now?

General PARTRIDGE. The first F–102's are being introduced into our operational units at the present time.

Mr. HAMILTON. Two new interceptor aircraft, the F–101 and the F–104 have been highly publicized recently in the press.

Can you describe these two aircraft?

General PARTRIDGE. The F–101B is a two-place, twin-engine, high-performance, long-range, all-weather interceptor. The aircraft is designed to operate in a controlled air defense environment such as we have in Air Defense Command.

The aircraft is armed to permit multiple bomber kills on each combat mission. The F–104A is a relatively light-weight, single-place fighter with exceptional performance characteristics in both speed and altitude.

Mr. HAMILTON. Do these fighters have adequate combat ceiling to cope with the Bison?

General PARTRIDGE. Based on our current intelligence estimates, I would say "Yes."

Mr. HAMILTON. Do you now have F–101's and/or F–104's in operational units of your command?

General PARTRIDGE. No, we do not.

Mr. HAMILTON. In view of the fact that the Russians are estimated now to have Bisons in operational units and are expected to add a considerable number to their operational inventory between now and the end of 1958, do you consider that present plans and programs will give us sufficient numbers of F–102's, F–101B's and F–104's to enable the Air Defense Command to adequately cope with the threat being posed now and through 1958 by the Russian long-range bomber force?

General PARTRIDGE. Between now and 1958, any attack by the Russians involving large numbers of jet aircraft would give us difficulties from an operational point of view.

However, during this same time period the F–102, F–101, and F–104 come into the inventory and by the end of 1958 we will have them in large numbers.

Mr. HAMILTON. To the best of your knowledge, do we not have sufficient capacity in plant facilities in the United States to produce the minimum number of these modern interceptors required within the next 2 years to cope with the Soviet Bisons?

General PARTRIDGE. This is a complex question involving many factors, including definition of the minimum number of modern interceptors required within the next 2 years to cope with the Soviet Bison. I wish I could give a direct answer but I am unable to do so.

The problem is not one dependent primarily upon the capacity of aircraft plant facilities within the United States. I am confident that we have sufficient production capability to build any reasonable number of interceptor fighters which it is decided might be required.

Mr. HAMILTON. Is it true that in your case plane production takes on less importance than other factors, and that your most pressing problem is really one of bringing your operational capability up to peak effectiveness?

General PARTRIDGE. It is true that the Air Defense Command needs new and better aircraft. I consider the problems pertaining to people, operating facilities, radar, and control equipment, and funds for both maintenance and operations and for construction to be equally pressing since they have an immediate bearing upon the ability of the Air Defense Command to carry out its mission.

Mr. HAMILTON. If the Russians should introduce into operation by 1958–59 a supersonic long-range jet bomber with a combat ceiling of 60,000 feet, would we have interceptors in our operational units at that time capable of coping with such a threat?

General PARTRIDGE. By 1958–59 the Air Defense Command will have a considerable inventory of supersonic fighters, but it would be impossible for me to state categorically that this interceptor force would be able to cope with the threat posed by a supersonic long-range jet bomber capable of flying at 60,000 feet.

The conditions under which the combat might take place would have too marked an effect on the outcome of the air battle for me to attempt such a direct reply.

However, I do feel that it is imperative that the Air Force push along a program for future fighters which will outperform anything presently programed to come into the Air Force inventory.

Mr. HAMILTON. How does the thrust of our most powerful operational jet engine compare with the thrust of the most powerful operational jet engine of the Soviets?

General PARTRIDGE. At the present time it is believed the Russians have in operational units jet engines of greater thrust than we have.

Mr. HAMILTON. General, isn't it a fact that the true test of an engine is found in the ratio of thrust to weight to fuel consumption? In terms of this ratio how do the engines in our newest fighters compare with Russian engines?

General PARTRIDGE. The true test of an engine's performance is a function of its use. The mission profile laid out for an aircraft will have a great deal to do with engine selection. For a long-range bomber specific fuel consumption is the most important parameter and then thrust to weight. For a high-altitude interceptor thrust to weight ratio is the most important.

I believe that a meaningful comparison of the engines in our newest fighters with those possessed by the Soviets could better be made by technical experts in executive session than by me.

Mr. HAMILTON. Very well, sir. General, did we in 1951 have under development an engine of greater thrust than the one now used by the Russians?

General PARTRIDGE. I am not familiar with this development, but I understand that the J–53 which we were working on at that time was approximately the same size as the large Russian engine.

Mr. HAMILTON. Do you know why we stopped the development of that engine?

General PARTRIDGE. No; I do not.

Mr. HAMILTON. Turning now to another subject, General, what problems do you have in personnel, base facilities and equipment, other than aircraft, which limit the effectiveness of your command to perform its assigned mission?

General PARTRIDGE. With regard to people, our problems divide themselves into two parts. First of all, we are short of air crews. We would like to be manned at a ratio of 1.4 air crews per operational aircraft or even higher if that were possible.

We are actually manned at about one crew per aircraft. The shortage of operationally ready air crews reduces the number of aircraft which we can keep on immediate alert.

Insofar as the ground echelon of personnel is concerned, we suffer from a low reenlistment rate among the people with critical skills, especially those dealing with jet aircraft and engines and electronics.

In the Air Defense Command, this results in our not being able to service and maintain properly not only the aircraft and engine but the complex fire-control system as well.

With regard to base facilities, we do not yet have sufficient airbases and we are in many instances crowding 2 units onto an airfield intended for only 1. Furthermore, we are in many cases short of hangar space and the facilities necessary to keep our very expensive aircraft with their complex equipment sheltered from the weather.

In addition, there are areas in which much work needs to be done in the development of better or more reliable equipment. Our fire-control equipment carried on the aircraft still is less dependable than it should be and an intensive development effort is being carried out to rectify this situation.

Senator SYMINGTON. Excuse me, Mr. Counsel.

Just for the edification of the committee, what does the phrase "fire control" mean?

Somebody might think it meant putting out a fire.

General PARTRIDGE. Fire-control equipment is the electronic equipment, the radar, the computer, and the other devices in the aircraft by which the pilot aims the missiles which have to be fired. The fire-control equipment also in the case of guided missiles sets up the initial path which the missile will take in departing on its course.

Mr. HAMILTON. Thank you, General.

General PARTRIDGE. Also, I have previously mentioned that our radars do not have sufficient coverage either at low or at high altitude but that improvements here, too, are being introduced through technical advances and by the installation of additional numbers of radar.

Mr. HAMILTON. General, do you rate personnel as your No. 1 problem?

General PARTRIDGE. At the present time we are having the utmost difficulty in keeping both officers and men in the Air Defense Command. Perhaps this is the most pressing problem at the moment.

Mr. HAMILTON. In spite of the problems which you have, do you feel that the present programs will give the country an increasingly better air defense system every year?

General PARTRIDGE. If the present programs can be implemented, I believe that we will have an increasingly better air-defense system every year.

But as I said before in answer to a previous question, we must measure our air-defense system against the present and projected enemy threat.

Mr. HAMILTON. General, would you agree that the Russian radar is comparable in quality with ours?

General PARTRIDGE. Technically, their radar is comparable to ours.

Mr. HAMILTON. How would you compare the latest Russian fighters in operational air-defense units with the latest fighters we have in operational air-defense units?

General PARTRIDGE. I would say that at the moment the Russian air-defense fighters are slightly superior to ours.

Mr. HAMILTON. How do our newest fighters coming into operational units compare with Russian fighters?

General PARTRIDGE. I have previously stated that the present Russian air-defense fighters are slightly better than our own. I also feel that as new models are introduced into our inventory we will probably

enjoy a period of technical superiority insofar as air-defense fighters are concerned. I am not able to forecast how the future Russian fighters will perform.

We must bear in mind that comparison of Russian air-defense fighters against our own air-defense fighters is of little value. We must compare the performance of our air-defense fighters against the performance of their long-range bombers.

Mr. HAMILTON. In view of the capability the Soviets have demonstrated in the major effort they have put into jamming the Voice of America, must we not assume that the Russians now have a highly effective jamming and countermeasures capability which will put an additional burden on our air-defense forces?

General PARTRIDGE. I am sure that the Soviets have people who are highly skilled technically in jamming equipment and in handling, devising, and using jamming equipment.

Ths electronics capability of the Soviets does put additional burdens on us, but I do not know just what effect this capability would have on our Air Defense Command or on the Strategic Air Command.

Mr. HAMILTON. Is our present air-defense system adequate to fight the new Bisons and Bears which the Soviets have in their operational units?

General PARTRIDGE. Our present air-defense system was set up originally to combat the threat of attack by the Soviet B–29 type bomber, the Bull. Since originally conceived, our air-defense system has been modernized as rapidly as practicable to increase its capability so that we might operate against the more recent weapons and aircraft which the Soviets have introduced.

This improvement is still continuing but as I have already pointed out, our present-day force is less effective than I should like to see it insofar as both our high-altitude and our low-altitude coverage are concerned.

Mr. HAMILTON. General, under our present system of air defense, are we providing adequate protection for all of the Strategic Air Command bases?

General PARTRIDGE. Strategic Air Command's base system is continually changing and it is the responsibility of the Continental Air Defense Command to shift its defenses in consonance with the realinements made by Strategic Air Command. At the present time, our air defenses are somewhat out of phase with SAC's base utilization program and steps are being taken to remedy this situation.

Mr. HAMILTON. Will you describe please for the subcommittee how you intend to control the widespread system of warning lines, interceptor radars, missile batteries, and interceptor squadrons which are part of your widespread command?

General PARTRIDGE. Studies have indicated that it is possible to employ electronic computers, electronic memory devices, and automatic data transmission to provide in the future far better control of the air-defense system than has been possible heretofore.

Since radar was invented, we have been using what is known as a manual system in which people, through the interpretation of spots of light appearing on their radarscopes and employing their judgment as to the conduct of the air battle, have directed the fighters through means of voice radio.

This system is slow, of low capability insofar as the number of fighters or other weapons that can be handled are concerned, and subject to many interruptions and mistakes.

By using the electronic computer and associated equipment, it is possible for one person to run an air-defense battle over an extended area. Such a system has been devised and the first elements of it are being installed.

Since the system performs on an automatic basis many of the operations which were formerly carried out manually by the fighter directors and other personnel engaged in air defense, the system has been given the name of SAGE which stands for semiautomatic ground environment.

Mr. HAMILTON. Under present plans and programs, will the SAGE system provide complete and adequate coverage?

General PARTRIDGE. So far the SAGE system has been programed to cover only the continental United States. We believe it essential that Canada one day have some equipment of the same general type as SAGE for control purposes.

Mr. HAMILTON. Isn't it a fact that the introduction of the SAGE system will substantially increase the capability of our air-defense system?

General PARTRIDGE. Yes. The introduction of SAGE should result in a very marked improvement in our air-defense capability.

Mr. HAMILTON. Is the SAGE system now operational?

General PARTRIDGE. No; it is not operational.

Mr. HAMILTON. Is our program for installation of SAGE on schedule?

General PARTRIDGE. It is difficult to answer this question directly because the schedules have from time to time been readjusted as experience has been gained in the construction and installation of the complex equipment. As far as I know, the SAGE program is on schedule at the present time.

Mr. HAMILTON. When will the SAGE system be completed?

General PARTRIDGE. The SAGE system presently programed is so extensive that some years will pass before it is fully operational; however, parts are being put into operation in the near future and the remainder of the system will be brought along as rapidly as possible.

Mr. HAMILTON. General, in your opinion is it possible for the United States to have an effective air-defense system?

General PARTRIDGE. It is possible for the United States to have a very effective air-defense system, and I might expand on that answer by explaining that the mere existence of an air-defense system is in itself a deterrent to aggression. The mere existence of such a defensive capability imposes on any prospective enemy additional requirements for tactics and for equipment which seriously degrade his strike capability. More important than that, however, is the fact that an effective air defense may deter the enemy from initiating an attack. It is only by achieving this situation that we attain a 100 percent effective air defense.

I might add that if the enemy does make the fateful decision to attack us through the air, we must be prepared to accept severe damages within this country.

Mr. HAMILTON. What new types of weapons do you expect our air-defense system to have great difficulty in handling?

General PARTRIDGE. There has been considerable discussion recently in the press and elsewhere concerning the delivery of mass destruction weapons by means of long-range ballistic missiles. While a defense against this type of attack can conceivably be devised, it is going to be exceedingly complex and difficult and will involve further effort and expense, and introduce into the air-defense system additional problems over and above those we presently encounter.

In my opinion, the provision of a defense against the ICBM will be one of the most difficult tasks ever undertaken.

Mr. HAMILTON. Will you describe for the subcommittee the problem of defending against the ICBM?

General PARTRIDGE. In this case we are actually planning for a system of defense against a weapon which is not fully developed. This makes our problem much more difficult. We consider that defense against the ballistic missile involves two elements.

One is a radar, computer, and communications system which will initially detect, identify, compute track and target information, and alert the countermissile system; the other is a countermissile system to intercept and destroy the ICBM warhead.

We will be dealing here, in the ICBM, with a weapon which will be going at a fantastic speed and altitude—probably above Mach 20 and above 500 miles in height—and the time allowed the defense will be very short. We must have a fast reaction capability coupled with a high degree of precision in achieving a weapon kill.

Mr. HAMILTON. General, just for the sake of clarity, could you make a rough estimate for the record of what the speed of Mach 20 would translate into in terms of miles per hour?

General PARTRIDGE. It is about 12,000 to 15,000 miles.

Mr. HAMILTON. Per hour?

Senator SALTONSTALL. How much?

Mr. HAMILTON. Did you say 12,000 to 15,000 miles per hour?

General PARTRIDGE. Yes, it will be of that order.

Mr. HAMILTON. Thank you.

General, will you describe the program of research and development which will be required to provide this country with a defensive system against the ICBM?

General PARTRIDGE. As I have said before, we have to develop new types of radar in order to get the long-distance warning that an intercontinental ballistic missile is headed our way.

In addition, we have to develop a countermissile of such characteristics that it can be fired into the air to intercept and destroy the incoming hostile missile.

It is possible that we will be able to use some of our present ground-to-air missiles in some improved form, but I should like to point out that this program as a whole is in its early stages and highly classified.

Mr. HAMILTON. How would you judge or evaluate the relative priority of getting a research and development program for attaining the anti-ICBM, as compared with the research and development program for the ICBM?

General PARTRIDGE. In my opinion, it is just as important to develop missiles to protect this country against attacks by hostile intercontinental ballistic missiles as it is to develop our offensive capability in the same field. Both are of extreme importance.

Mr. HAMILTON. In terms of research and development to improve our air-defense capability, would you not agree that we need to concentrate more effort on improving the thrust of our jet engines, on increasing the height and range capability of our radars, on improving our communications, on an antimissile against the ICBM and the IRBM, on improvements of parts and components of aircraft and missiles operating at very high temperatures, and on improvements in the reliability of our fire-control systems?

General PARTRIDGE. A great deal of work has been done along these lines in the past and the effort must continue.

Mr. HAMILTON. It is our understanding that you have laid out a program which you believe would give us a satisfactory continental air-defense system to combat the manned-bomber weapons system of the enemy.

Would you tell the subcommittee what amount of money is required to take the various measures you have incorporated into your program, and what these measures include?

General PARTRIDGE. We have laid out a program for the continental United States, which we believe would give us a minimum effective defense versus manned aircraft. It would not provide defense against ICBM's, although parts of the program may well be adapted for this purpose.

A rough estimate of the money required to implement this program would be $61 billion, for the years 1951 to 1965. The capital outlay would run about $24 billion; and operating costs about $37 billion, giving us the $61 billion, total.

Very little of this has been spent already; the big costs still lie ahead. In addition to these, there would have to be other expenditures on air defense elements furnished by the Army and the Navy, and on air defense elements outside the United States, such as the Distant Early Warning Line.

Mr. HAMILTON. You testified that your recommended program for the Air Defense Command from 1950 to 1964 will cost approximately $60 billion and it is our understanding that this expenditure covers the Air Defense Command alone. Is that correct?

General PARTRIDGE. I believe I used the figure $61 billion for the 15 years from 1951 through 1965.

Mr. HAMILTON. That is correct.

General PARTRIDGE. This total covers Air Force expenditures for the Air Defense Command within the United States, and does not cover expenditures outside the country, Army or Navy outlays for air defense purposes, or any other items which might be added to the system beyond those now planned.

Mr. HAMILTON. Since you testified that the average rate of expenditure has not equaled $4 billion a year in the past, does that not mean that the sums to be spent in the future would substantially exceed $4 billion a year to meet your recommendations?

General PARTRIDGE. Yes. The amount of money needed yearly in the future will be much greater than we have been required to expend in the past.

Mr. HAMILTON. Thank you, sir. That concludes my questions.

Senator SYMINGTON. Have you a further statement you would like to make, General?

General PARTRIDGE. Mr. Chairman, with your indulgence, I should like to make a very brief closing statement.

First of all, I appreciate the opportunity to appear before your committee to give you a picture of the air defenses of the continental United States. I should like to say that while the data used is the best that I could obtain, the opinions expressed are my own and are presented from the viewpoint of a field commander.

Unfortunately, for security reasons, it was not possible to bring out by my answers in this open hearing, as complete a picture of the continental air defense system as I was able to give you in the closed sessions. For this reason, it might be well for me to summarize very briefly the status of our air defenses.

The Continental Air Defense Command is a joint organization composed of Army, Navy, and Air Force units. It is a nationwide organization which operates on a 24-hour-a-day basis, continuously.

Tremendous effort is going into the day-to-day operation of the system and still further resources and energy are being expended to modernize, improve, and extend the system and keep it alined with an ever-growing Soviet threat.

Although the questions introduced here today have highlighted some of the deficiencies of the air defense system as a whole, I should like to stress in closing that the Continental Air Defense Command is fully operational and prepared to engage in an all-out air battle at a moment's notice.

We hope that the existence of this defensive force may prove a decisive factor in keeping us out of war.

Senator SYMINGTON. Thank you, General, for a fine presentation.

Senator Saltonstall?

Senator SALTONSTALL. Mr. Chairman, I feel the same way that you do, that I have great confidence in General Partridge and I particularly appreciate the last paragraph of his statement in which he says "we hope that the existence of this defensive force may prove a decisive factor in keeping us out of war."

We all feel the same way, General, and we have much confidence in you.

General PARTRIDGE. Thank you.

Senator SYMINGTON. Thank you, General. Your closed-session testimony has now been cleared for security purposes by Admiral Davis. Will you please review it and be prepared to come before this committee in open session in order to discuss it whenever you are notified?

The committee appreciates your appearance this morning.

We will have a 15-minute recess and then we will have an executive session with representatives from the Army.

(Whereupon, at 11:10 a. m. the committee was recessed, to reconvene in executive session.)

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